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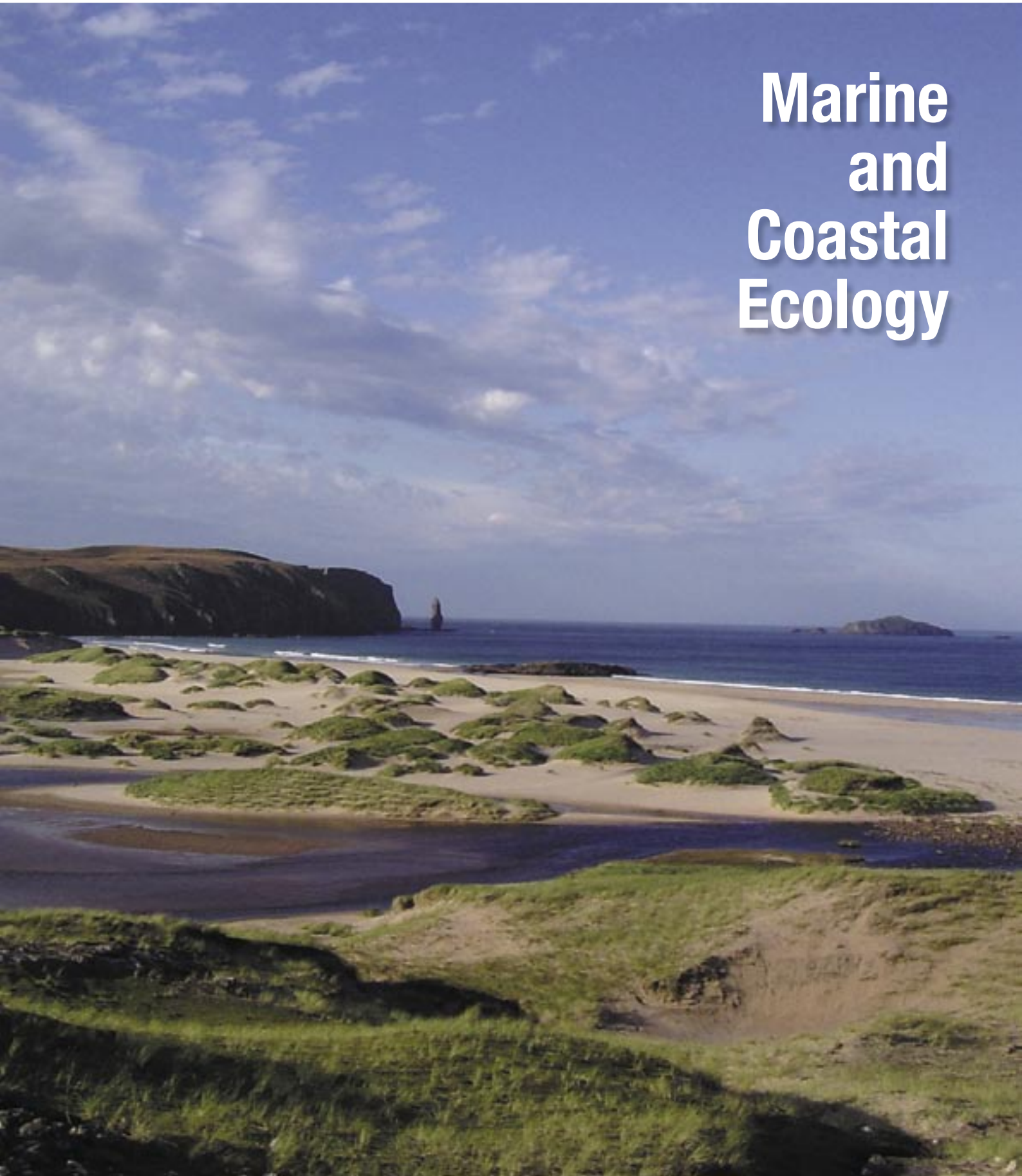

Marine and Coastal Ecology

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British Ecological Society

Editorial

Two years ago, I was invited to give the Fellows lecture at the Autumn IEEM conference. My chosen subject was 'Mitigation – what will we leave behind?' I am optimistic that within five years we shall see the creation of, for example, a mitigation or habitat banking industry delivering large-scale new, restored or enhanced habitats, to reverse the landscape and biodiversity degradation that has happened over the past 50 years. The ecologists' role would then be expanded from everyday involvement in a multitude of ecological assessments and Environmental Impact Assessments to one of design, technique development, contractor implementation, supervision, monitoring and management.

I don't consider this is just a dream. There are a number of reasons why we need to 'up our game'.

First, there is still an attitude problem in the development industry with respect to biodiversity conservation. Ecology is seen as a major constraint – something that needs to be dealt with. We have disaggregated our own species survival with anything to do with our environment – the links between food production, biodiversity as a resource and ecosystem services have been severed. We are beginning to get the message about ecological footprints but feel powerless about how to maintain standards of living whilst consuming less. The gap in understanding between the rural and urban environments appears ever wider yet physical and mental health and well-being have been shown to be dramatically improved by access to 'wild' places. Physical inactivity and obesity cost the British taxpayer £11 billions a year. We could create a lot of wild places with that!

Second, to have more people visit and re-engage with the countryside we need more places for them to go. Protected sites in the south of England are already under immense recreational pressure (witness the Thames Basin Heaths issue). The concept of 'ecological networks' is gaining momentum. A high level workshop in January involving leaders from country agencies, academic institutes and government departments, has formulated a programme for the next IEEM annual conference entirely on ecological networks and their potential for stitching back the fabric of the British countryside. These networks would not be mere interconnecting hedgerows but would involve the large-scale habitat restoration of farmland involving woodland, wetland, riparian systems, grasslands and heaths.

Third, we need to act now to adapt to climate change. Enabling distributional shifts in farming capacity and biodiversity – crops, species and habitats – will be essential. Countryside policies supporting (and indeed requiring) ecological networks would facilitate such adaptation.

Finally, there is huge potential to make better use of the planning system to deliver proper mitigation and compensation. The creation of habitat banks which broker 'deals' between developers, landowners and planning authorities in appropriate locations, could assimilate and manage funds for the creation of ecological networks, providing an abundance of new and interesting places in the countryside for people to visit. The developer would be released from the physical task of providing on-site mitigation in many circumstances, enabling something of much greater value to be created and managed by professional ecologists. Planning Gain Supplement, as outlined in the recent Barker Review, would provide one funding stream for such schemes. Some network sites on farmland, under the management of the landowner, could even be established to provide their own secondary income stream from the visitors attracted to them.

I don't see any major obstacles to the above apart from timescales and local politics. Legislation would enable it to be implemented more quickly and, certainly as far as climate change adaptation is concerned, we can't afford to wait.

David Hill CEnv FIEEM
Chairman of The Environment Bank Ltd and Board member of Natural England and the Joint Nature Conservation Committee.

Contents

Cover image: The remote Sandwood Bay on the far north-west coast of Scotland. It is best known for its mile-long beach and Am Buachaille, a sea stack.

Photography: John Box CEnv FIEEM

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.

Sand Dune and Shingle Network

Paul Rooney CEnv MIEEM
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and
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Sefton Coast Biodiversity Partnership Project Officer/Coastal Network Project Officer, Sefton Council/ Liverpool Hope University

Introduction

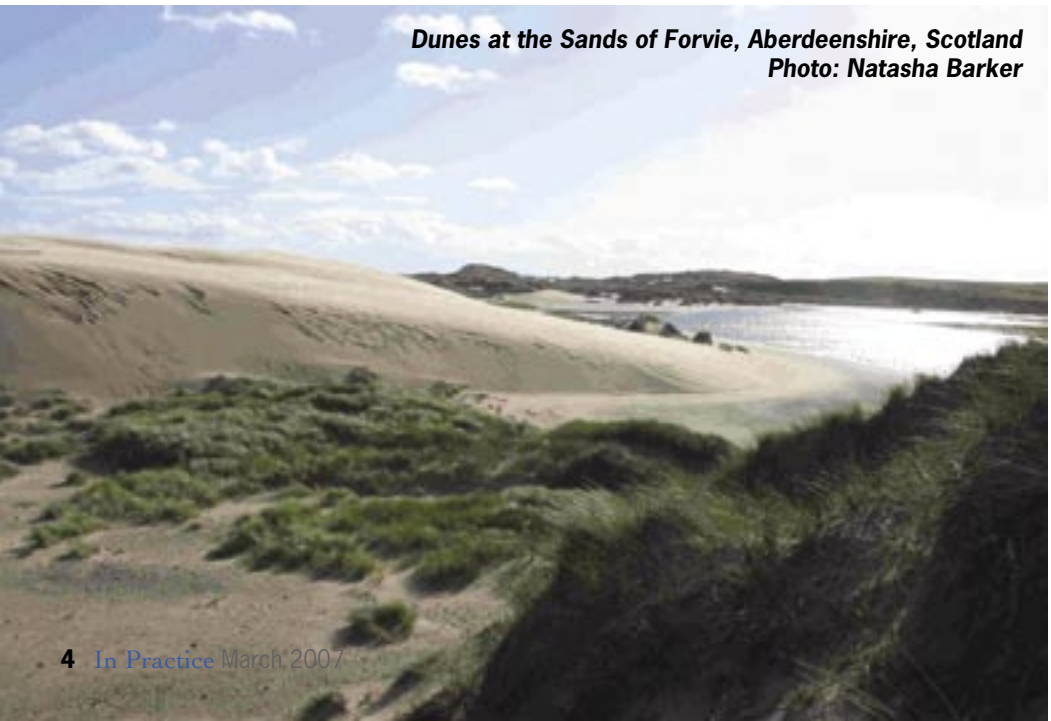
For a number of years we have recognized the value of sharing experience through coastal networks. For instance, in 1987 academics and managers from throughout Europe came together in Leiden, the Netherlands, for the first time to discuss future directions for conservation management of coastal dunes. This meeting set the seeds for a network of coastal dune practitioners and academics. Following this the coastal dune community continued to share their understanding and practice using an informal network and taking opportunities to meet at coastal conferences and events held throughout Europe. Arising from these events was a clear call for the informal coastal sand dune network to be developed further with the purpose of sharing conservation practice on a more active and focused basis.

The Local Biodiversity Action Plan (LBAP) process has generated a wide range of actions in response to the coastal sand dune and vegetated shingle Habitat Action Plans (HAPs), but it is far from clear whether there is any contact between the various LBAPs on broadly similar actions. With the current review of national HAPs comes an opportunity to review this work and to identify generic issues which could benefit from guidance and networking.

Network launched at national LBAP event

The UK Sand Dune and Shingle Network was launched at the Natural England and Defra Local Biodiversity Action Plan (LBAP) seminar, Liverpool 5-7 December 2006, during two workshops titled 'Coastal Networks: how can your LBAP help?' The workshops were used to inform the priorities for the Network in relation to LBAPs. The workshop objectives were:

- to outline what the coastal dune and shingle network has to offer;
- to hear from delegates about the value of networks;
- to help set priorities for the network in relation to LBAPs; and
- to encourage involvement in the network.



Dunes at the Sands of Forvie, Aberdeenshire, Scotland
Photo: Natasha Barker

Workshop findings

Most participants at the first workshop session were actively involved in the conservation of the habitats, whereas most in the second session were only generally interested in the habitats (*e.g.* at an estuary or Integrated Coastal Zone Management level). This difference was reflected in the discussions about the value of the network.

Both workshop sessions came to similar conclusions on what makes a good network. Feedback included the following points - strong leadership /drive/coordination is desirable for the network; a network that says up front what it does and registers interests, facilitates training and events and is up to date; it should provide case studies and act as a contact point for advice/ dialogue with experts, but must not be just a talking shop; it should include committed partners and regular users, have clear rules of engagement and be based upon altruism and trust.

The next question was whether the UK BAP process is a good foundation for the UK Dune and Shingle Network, and whether BAP work should be at the core of the Network. There was general agreement overall that this should be the case. However, participants at the first session could see a clear link between the BAP process and the Network. Other views were more cautious advocating that there are other key players such as Estuary Projects and Shoreline Management Plans. Many in the Network will have no clear involvement at the national BAP level, so the relevance is perhaps best seen at the local level.

On the question whether the Network should try to reach the whole dune and shingle stakeholder community the advice was to be pragmatic and begin with a natural 'core' developing from that point as resources permit. It was felt important to engage with individuals and organisations who might not consider themselves naturally part of the Network. The Network could help LBAP coordinators to work with local communities, rather than trying to reach

all the public interest groups.

Participants were asked to consider actions that they were coordinating could be assisted by the Network, and priority themes for the Network. There was more discussion in the first session where participants were more actively involved in delivering the HAPs for sand dunes and shingle.

Workshop participants also raised generic issues which affect the delivery of BAP and LBAP targets. In the discussions it is clear that a number of these relate to the overall BAP process (the issues of funding, continuity, *etc.*) and some to wider sectors and issues.

There was some support and interest from participants for being involved in planning and hosting events and for regional workshops. Some useful suggestions were made which will be followed up by the Network coordinators. There was clear direction that wherever possible the network should 'piggy-back' its meetings onto others, *e.g.* running a specific event in a larger meeting.

Marram grass in the sand Photo: John Houston

There was also support for developing international links, especially in relation to potential future funding through, e.g. the Interreg IV programme. The value of wider experience and case studies is understood, but this needs to be relevant to the UK perspective.

The workshop sessions concluded that:

- there is support for this type of specialised network from practitioners who are directly involved in delivering LBAP targets for these habitats;
- the network is relevant to the UK BAP and LBAP process, but also needs to serve a wider community of interest;
- there are a number of specific areas where the network can assist the delivery of BAP targets through research, publications, discussion and workshops; and
- regional meetings are considered useful, especially if these can be linked to existing initiatives and events.

A record of the discussions has been prepared and is about to be published in the event proceedings.

Viewing the dunes at Newborough Warren NNR, Anglesey, Wales Photo: Paul Rooney

Network Aims and Actions

The Sand Dune and Shingle Network aims to support the sharing of experience on the management of these habitats through reviews of conservation practice, research, publications, training, workshops and conferences, and the promotion of an evidence based approach to decision making. Through these actions we have an opportunity to support those engaged with the delivery of the sand dune and vegetated shingle HAPs. The Network will initiate the HAP action 'promoting the exchange of information on sand dune ecology and management among European states'.

There are a number of intended actions for workshops and reviews. Several LBAPs, for example, are involved in the control of Sea Buckthorn *Hippophae rhamnoides*: we need a national review of this subject, and work is already underway. With the move to Natural England, access and recreation may come to the fore; what are our current concerns on dune and shingle habitats? Later in 2007, work will be undertaken to further develop the vegetated shingle aspect of the Network.

The network has already organized three events.

- A seminar at the Royal Birkdale Golf Club, 26 April 2007, to address the specific interest of working with golf courses for dune conservation.
- A workshop in the Snowdonia National Park, Wales between 29 – 31 May 2007. The purpose of this event is to bring together a small, motivated and highly focused group of experts in coastal dunes to advance understanding of, and conservation practice in, this habitat.
- An international dune conference 'Changing Perspectives in Coastal Dune Management'. This will be held at Liverpool Hope University, Liverpool from 31 March to 3 April 2008. It will review experience in the management of coastal dunes.

Further details of these and other events are available at www.hope.ac.uk/coast

Conclusion

As coastal managers and academics operate in the context of the complexity of the coastal zone they are members of many communities, but their experience is based firmly in distinctive habitat types. Within the context of sand dune and shingle habitats there is much to share within the UK, and an enlarged Europe, of the growing experience of habitat management practice.

Acknowledgements - The UK Sand Dune and Shingle Network based at Liverpool Hope University acknowledges the financial support of the Higher Education Funding Council for England (HEFCE) Higher Education Innovation Fund (HEIF3) and Natural England. The Network is backed by the EUCC-The Coastal Union.

For more information about the UK Sand Dune and Shingle Network please contact:

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Life On the Edge - Conserving Coastal Soft Cliffs

Andrew Whitehouse
Buglife - The Invertebrate Conservation Trust

Cicindela germanica
Photo: Roger Key

Maritime soft rock cliffs and slopes are a habitat that, in the past, has been largely neglected. They are widely recognised for their geomorphological interest, many are notified as geological Sites of Special Scientific Interest. However, much less well known is their importance for supporting rich invertebrate assemblages and as a refuge for rare insect species. 28 species of insect are found only on soft rock cliffs in the UK, of these 22 are Red Data Book species (Howe, 2002), including the cliff tiger beetle *Cicindela germanica* (RDB3), mason bee *Osmia xanthomelana*, and Glanville fritillary butterfly *Melitaea cinxia* (RDB3). Alongside these invertebrate species restricted to soft cliffs, there are at least another 75 species that have an affinity to the habitat.

In basic terms maritime soft cliffs are cliffs in rocks that are poorly resistant to the natural processes of erosion that shape our coasts. These cliffs are formed of relatively easily eroded material such as clays, friable sands, shales and glacial deposits, contrasting with much more resistant 'hard' rocks. The cliffs are subject to frequent slumps and land slips caused by erosion by the sea, erosion by the rain, storms, and groundwater percolating through the cliff. Soft cliffs erode more quickly than hard cliffs and are often sloped or terraced rather than vertical like many hard rock cliffs.

Unprotected soft rock cliffs are a scarce resource in the UK, are concentrated in England and Wales, and are estimated to have lengths of 256 km (Pye and French, 1992) and 101 km (Howe, 2002) respectively. Far shorter lengths of soft rock cliffs occur in Scotland (18 km total) and Northern Ireland. Some of the richest sites for invertebrates are the landslips along the coasts of Dorset and south Devon, the Isle of Wight, and the Gower and Llyn peninsulas in Wales.

The significance of coastal soft cliffs for invertebrates hinges on their capacity to offer a historical continuity of microhabitats rarely predictably found elsewhere. Periodic erosion and slippage events create areas of bare sand and clay, and maintain pioneer and ruderal plant communities essential to many bees and wasps, ground beetles and phytophagous insects. The presence of seepages, flushes and other hydrological features enhances the invertebrate interest further. Complex micro-habitat mosaics provide the full range of resources required by invertebrate species at the different stages of their life cycles. Temperature is a key element in influencing the invertebrate fauna, particularly with regard to thermophilic species. From a comparison of sites around the UK (Whitehouse, in prep) the most important sites tend to be those with a southerly facing aspect, offering significantly warmer microclimates.

Black Ven, Dorset
Photo: Andrew Whitehouse

Maritime soft cliff as a habitat is a key component of the UK BAP Priority Habitat 'Maritime Cliffs and Slopes'; the main biodiversity importance is often the invertebrate fauna. A number of UKBAP Priority Species are dependant on the habitat, including the cliff tiger beetle *Cicindela germanica*, the mining bee *Lasioglossum angusticeps*, the four-banded weevil wasp *Cerceris quadricincta* and the dotted bee-fly *Bombylius discolor*.

Threats and management issues

Maritime soft cliffs and slopes are amongst the most natural habitats in the UK, on many sites active human intervention or management is not required to

maintain the habitat and species diversity. However, due to a lack of recognition for their nature conservation interest much of the UK resource has been altered or lost behind coastal protection schemes, or degraded through inappropriate management of cliffs and slopes and their immediate surroundings.

The main threat to the invertebrate fauna of soft cliffs is the disruption of the natural processes of erosion that maintain the habitats of vital importance to their survival. The ecological interest of a soft cliff is intrinsically linked to its rate of erosion. Too little erosion leads to the loss of bare ground and early successional habitats, the vegetation becomes more stable, closed grassland and scrub develop. Too rapid a rate of erosion and there is little chance for an interesting fauna to colonise. Attempts at coastal protection work or cliff and slope stabilisation have destroyed and damaged many sites around the UK and continue to pose a threat. All proposed coastal protection or stabilisation works affecting soft cliffs should include a full assessment of the impact of the scheme on invertebrates. The ecological importance of soft cliffs must be recognised within the Shoreline Management Plan review process where relevant.

Osmia xanthomelana
Photo: Nicolas J. Vereecken

Attempts are often made at stabilising cliffs by altering natural drainage patterns. This can alter the way in which a cliff functions in a geomorphological sense, which has a knock-on effect on maintenance of the soft cliff habitats. Altering drainage patterns also robs the cliff of its supply of freshwater, resulting in the loss of freshwater flushes and associated wet habitats. The abstraction of water inland can also reduce the supplies to the cliffs.

Insensitive cliff top management is another major threat to soft cliff ecology. Agricultural improvement of coastal grasslands and conversion to arable on the cliff top can have significant impacts on the ecology of the cliff slope. Other land uses such as car parks, caravan sites and golf courses have replaced unimproved cliff top grasslands in many locations. Appropriately managed cliff tops can provide a range of resources, from acting as a source of plant material for the eroding cliff face; providing forage for bees, wasps and others; and providing ecological linkages between sites. Where favourable cliff top habitats are lost, vulnerable insect species are confined to the cliff slope, a form of coastal squeeze.

There are opportunities for enhancing many soft cliff sites through restoring natural or semi-natural cliff top grassland. This could be achieved through the creation of buffer zones flexible or wide enough to accommodate the retreating cliff. Effective targeting of agri-environment schemes will be crucial to achieving this.

Buglife Soft Cliff Project

For the past two years Buglife have been studying the ecology of soft cliffs in the UK with an aim to inform and initiate the measures required for the sustainable management this habitat and its invertebrate biodiversity in the future. This project is funded by the Esmée Fairbairn Foundation.

The project aims to build upon the existing ecological data on UK maritime soft cliffs, and to make this data easily accessible and available to managers and decision makers, and those involved in local and national BAP delivery. We have collated existing data and strengthened this dataset through new survey work around the UK, including intensive surveys of sites in Dorset, the Isle of Wight, Norfolk and North Yorkshire.

This data has allowed us to audit the invertebrate fauna of soft cliffs in the UK and identify the most important sites. We have identified generic threats to soft cliff invertebrates and specific issues impacting on priority sites. The resulting management recommendations will enable better informed sustainable coastal management policy and more effective targeting of environmental land management schemes.

Buglife's national soft cliff report will be launched in May 2007; this will be followed by a number of regional workshops. For more information please contact the author.

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Find out more about Buglife at www.buglife.org.uk.

Involving Stakeholders in Coastal Biodiversity Action - Coastal Futures: Humber Community Project

Emma Jasper
Project Manager, Coastal Futures: Humber Community Project

Engaging and involving stakeholders early in flood risk management projects is both vital and necessary. '*Coastal Futures: Humber Community Project*' is looking at how communities around the Humber estuary currently feel about and use their coastline, as well as looking at what their concerns are about how their coastline is changing.

Our coast is one of the most dynamic landscapes in the UK. It is enjoyed by thousands and is vital for a whole range of human activity and wildlife. But it is changing: the sea level is rising as the land sinks, and its rise is now accelerating due to climate change.

We also expect bigger, more frequent storms to occur. This will increase the risk of flooding. Many of our existing flood defence banks are at the end of their life and will struggle to cope with this increased volume and pressure of water. Maintaining them will become more difficult and expensive therefore the cost to taxpayers is likely to increase.

Paull Holme Strays, Humber estuary, 2004 Photo: Environment Agency

Sea level rise will also result in some intertidal habitat loss, due to being squeezed against hard flood defences such as walls and embankments. Unable to naturally migrate inland, these habitats could eventually disappear. This is a process known as '*coastal squeeze*'. Intertidal habitat forms our first line of flood protection, without which the costs of coastal flood management will increase still further, and homes and businesses will become increasingly vulnerable.

Coastal Squeeze also creates the additional problem of breaching the EU Habitats Directive *i.e.* by maintaining man made flood defences to protect people against flooding, directly prevents intertidal habitats from migrating inland and they are lost. Therefore, to continue to provide and maintain flood defences near major cities and ports, the Environment Agency is required to compensate for this loss of intertidal habitat elsewhere in the same system.

One way to compensate for coastal squeeze and to ensure vital habitats can exist, is to use a technique called '*managed realignment*'. This is the process of moving the line of flood defences inland and then breaching the old defence, allowing the sea to naturally create more intertidal habitat in between. This technique also provides a good level of protection from flooding, and means flood walls and embankments don't have to be built as high to provide the same level of protection to those communities behind.

Detailed work for the '*Coastal Futures Project*' has reviewed

the economics of existing managed realignment schemes in the UK[1]. It found that managed realignment clearly has the potential to offer sustainable flood defences and to reduce flood management costs in the areas to which it is suited. Therefore, the benefit to local communities is a higher level of protection, for less cost, allowing the national funding for flood risk management to go further and provide benefits to more people. Whether managed realignment is better than other flood management options is highly site-specific. However, existing successful schemes demonstrate that managed realignment can often make economic sense, providing the most sustainable flood protection option.

Many communities remain to be persuaded of not only the issues of climate change, sea level rise and subsequent changes to their coastline, but of the benefits of managed realignment. This is slowing down the uptake of the technique, the reduction of flood risk and the realisation of some of the benefits.

The '*Coastal Futures: Humber Community Project*' seeks to develop a best practice model for engaging communities in all aspects of proposed managed realignment projects, gaining their support for this technique and improving understanding of the range of benefits. It may also provide information to other coastal management stakeholders on the benefits of this approach to coastal management.

The project is a partnership lead by the RSPB, in conjunction with the Environment Agency, Natural England and sponsored by Defra. The project has both a national and local angle. Nationally it looks at general issues that UK communities, facing coastal flooding, may experience. Then uses the Humber estuary as a pilot to look at the best way to address these concerns and how best to engage these communities to find a solution. Nationally the project has produced some larger pieces of work in the form of:

- a piece of economics work looking at the environmental, economic and socio-economic benefits of managed realignment - using the UK's six largest managed realignment sites to draw evidence from. Undertaken for the project by Dr Rob Tinch (Environmental Futures Ltd); and
- initial market research into both the quantitative and qualitative responses from affected communities in coastal flooding areas along the East Coast.

Both sets of findings will shortly be added to the project's website at www.coastalfutures.org.uk.

Locally, on the Humber estuary, project staff are looking at ways to link those communities affected in becoming actively involved in the decisions, designs and ownership of such flood risk management techniques. This began in year 1 (September 2005 – September 2006) with a process of researching what information and understanding the communities actually had of future plans to reduce flood risk in their area, and then looking at how to fill these gaps with the appropriate information and support.

Current work has now moved on to looking at ways the project can support these communities in planning for what they want in the future *i.e.* if managed realignment is the option best suited to their area then what do they want/not want from the process? This is looking at what these communities value about their current habitats and working with the Environment, Agency, Natural England and RSPB to look at what can be developed, enhanced or gained from those habitats that will be created through the managed realignment site.

Equally, this involves looking at how the site should be managed in the future and the effects this will have on the surrounding community. The project is currently supporting these communities in looking at what gains the local villages may wish to develop from the potential visitors associated with managed realignment. This will be planned in such a way that ensures the village keeps its values and heritage in the process, along with developing additional socio-economic benefits, but that links with the Environment Agency's flood risk management solutions.

Project staff liase with these local communities in a number of successful ways. This ranges from regular information buses to the most rural of these communities, regular attendance at Parish Council meetings, support of existing local events, updates in existing parish newsletters, set information events for different groups of people and involving people in local media opportunities. An example being the recent Radio 4 '*Nature*' programme that included local people presenting their thoughts and feelings about flood risk management plans in their area.

The ethos of all of these examples is that there is a member of staff whose role it is to always be available to ask related questions and find related information from - someone who is always visible and approachable within their community.

All of the above approaches are hopefully making some steps towards supporting absolute public participation as opposed to public 'informing' - public participation is more than just informing people about plans and decisions already made and ensuring their invaluable local knowledge helps shape the site to the benefit of everyone.

[1] R Tinch (2006) *Economics of Managed Realignment in the UK*. Available through Coastal Futures Website at www.coastalfutures.org.uk.

Delivering BAP Locally - Marine and Coast

Cheryl Marriott MIEEM
Assistant Conservation Manager, Cornwall Wildlife Trust

A Seasearch diver surveying pink sea fans
Photo: Simon Burt

In the 2005 Biodiversity Action Plan (BAP) reporting round there was gloomy news for marine and coastal habitats. The three habitats that reported continuing or accelerating declines were all marine or coastal; saltmarsh, muddy gravels and horse mussel beds. Development on the coast was cited as being a significant threat by many lead partners. Add to this the fact that a lack of control of damaging activities in marine and coastal habitats within protected areas was cited as a major constraint, and things look fairly bleak.

With this in mind the Local Biodiversity Action Plan (LBAP) conference in December 2006 set about trying to find out how marine and coastal habitat and species BAP actions can be delivered at a local scale. We wanted to find out where things are going well from the LBAP co-ordinators delivering projects on the ground (or in the sea!) so that we could spread best practice. We also wanted to find out where things are not going so well and what LBAP co-ordinators felt needed to be done to improve things in their areas, with a view to passing the information on to decision and policy makers. The full conference proceedings can be found on the UK BAP website www.ukbap.org.uk.

Habitat and species data collection is a key issue with marine and coastal habitats. Marine data in particular is difficult to collect. Marine surveys often involve divers who can only stay down for short periods and are limited by weather and visibility conditions. There are other methods such as drop down video surveys but these are expensive and are still limited by weather and visibility. Seasearch (www.seasearch.org.uk) is a successful project co-ordinated nationally by the Marine Conservation Society, which trains volunteer recreational divers to carry out survey work on their dives. Dives can be focussed on a particular habitat or species; in Cornwall there is currently a project to survey for pink sea fans, a coral species on the UK BAP list, providing good baseline data on numbers, location and condition and thus helping to target work to conserve them. Alternatively, dives can be area based, aiming to build up a map of the local seabed. Area based dives in Sussex have led to the identification and designation of 24 Marine Sites of Nature Conservation Importance, the first such sites in the country. Unfortunately, these sorts of survey are not appropriate in all areas. In the north-east for

Volunteers surveying vegetated shingle at Rye Harbour, East Sussex
Photo: Patrick Fitzsimons/East Sussex County Council

example conditions are predominantly unfavourable for diving so there is very little seasearch activity.

Collection of marine data is further hampered by the fact that marine species and habitats can suffer from being 'out of site, out of mind'. Coastal habitats however, are physically easier to access, making data collection easier, but the complex and dynamic nature of coastal habitats means they are often poorly understood. Aerial photography can be useful for mapping the extent of coastal habitats, for example the BRANCH project aims to map coastal habitats of the Channel coasts to better inform spatial planning in the light of climate change. A more local approach is being taken with coastal vegetated shingle in East Sussex where volunteers are encouraged to report on key species and communities, providing important information on habitat condition. Both projects provide data to the Local Records Centre. Local Records Centres are the obvious places to hold the information and individuals, organisations, environmental consultancies and private companies should routinely pass information to them. Unfortunately some areas still do not have such facilities. LBAP co-ordinators from Lancashire reported that there is very limited local data available on marine and coastal habitats and species, and no Local Records Centre to collate what information there is. Partly as a consequence of this, the Lancashire LBAP partnership has little involvement with marine and coastal issues at present. Regional collation of data and co-ordination of projects has been highlighted by several LBAP officers as being crucial, particularly since we are often dealing with very mobile species and dynamic coastal habitats.

Another constraint on delivery is the vastness of the task. The Cornwall LBAP, for example, has 12 marine and coast Habitat Action Plans and 13 Species Action Plans, with over 130 actions to deliver! With the terrestrial action plans as well there is a huge amount expected of LBAP partnerships. Inevitably the easiest actions are tackled most readily, which means coastal and particularly marine habitats and species often fall off the end of the list. In Ayrshire consultants have been brought in to decide which parts of the BAP to prioritise, but unfortunately the focus is terrestrial since those targets are more readily achievable.

So what can be done to improve delivery of marine and coastal BAPs? The top recommendations from LBAP co-ordinators are:

- we need good national co-ordination of LBAPs to aid understanding of national distribution of habitats and species;
- all regions should have a marine focussed BAP co-ordinator;
- all known marine and coastal data for an area should be collated in one place and made accessible, including that collected for environmental assessments;
- where there are no Local Records Centres there needs to be an alternative, even if it is at a regional level. (In Northern Ireland data is currently being collected centrally, rather than locally);
- we need to increase the time-scale of project funding, 3 years is not long enough to establish a project that will be sustainable long-term;
- LBAPs should prioritise what actions they report on;
- LBAPS should report effort against actions, not just progress against targets, as this will show what is being done and encourage more people to get involved;
- aerial photography should be made available inexpensively to aid mapping and monitoring of coastal habitats; and
- LBAPs should not lose sight of what they are gathering information for!

A final thought is that it is all too easy with the BAP process to get blinkered, and forget habitats and species that are important locally, but may not be on the UK priority list, grey seals in Cornwall for example. The UK BAP list will be continually reviewed, and species that are not on the list currently may be added in future and vice versa, we all need to keep this in mind.

Sea campion (Silene uniflora) on vegetated shingle, East Sussex ***Photo: Barry Yates/East Sussex County Council***

Raising Awareness of UK Marine Biodiversity

Angus Bloomfield
Biodiversity Projects Officer, Marine Conservation Society

Few people appreciate the astonishing diversity of life within our seas. The marine environment is out of site and out of mind to much of the British public. As a nation, we may like to spend our holidays at the beach, but not because of our interest and engagement with marine life. If the public perception of our seas is of a vast, limitless and generally-lifeless void (or if anything: cold, wet and dangerous), then it's not surprising they show such little buy-in to marine conservation, or even the sustainable management of marine industry and development.

2006 saw the launch of a major new project from the Marine Conservation Society, designed to raise awareness of, and conservation action for, the little known but diverse marine wildlife that we have in our cool (temperate) seas. The *Cool Seas Roadshow* combines three complementary programs of work: an educational and awareness-raising tour of England's primary schools, as well as selected non-school events and shows; promotion of reporting schemes for public sightings of marine wildlife; and the provision of advice, on implementation of marine Species Action Plans (SAPs) and Habitat Action Plans (HAPs), to local and regional Biodiversity Action Plan (BAP) practitioners.

Educational Roadshow

Tropical seas and coral reefs may be familiar, if little understood, but UK citizens are genuinely amazed to learn about the wonderful creatures that inhabit the cool waters around us, right here in the UK. The Cool Seas Roadshow gives both children and adults the chance to get up-close and personal with life-size and life-like models of whales, dolphins, sharks, giant turtles, seals and porpoises - all animals resident in the seas around us. Between September 2007 and February 2008, the project will visit 150 primary schools across England, plus 37 days at non-school events.

The roadshow spends a full day within each school that it visits, with interactive workshops delivered by marine wildlife education specialists. Pupils and teachers, alike, are thrilled to find their school halls filled with the stunning life-sized models, which are introduced one species at a time. Using a range of specially developed displays, these are then related to the multitude of smaller creatures and plants that make up our temperate marine ecosystem. The audience learns that every organism – from basking sharks to zooplankton – is ultimately linked, and thus has a vital role to play in the life of our oceans.

Using simple demonstrations and role-play, the audience then learns about the threats to our marine life – including overfishing, bycatch and pollution – and we suggest a range of simple actions that we can all do to make a positive difference – such as buying fish from sustainable sources, and responsibly disposing of our waste.

Primary school pupils are enchanted by the wonders of our marine world, and we hope our roadshow will be just the starting point on their voyage of discovery. To this end, we have developed a range of classroom resources for teachers, including a full-colour A1-sized poster and downloadable lesson plans and activities – all curriculum-linked so they don't have to be squeezed in between more traditional topics. In case some teachers decide not to follow up the roadshow, back in their classrooms, we also provide every pupil with their very own *Cool Seas Action Pack* and bookmark, full of fun activities and further information. This is designed to stand alone, so that pupils can learn more, even without teacher or parent input. They are also directed to the *Cool Seas Kids* section of our website, for further information and activities.

By visiting 150 schools, with an average of 250 pupils per school, the project will raise awareness of UK marine biodiversity among 37,500 primary school pupils, plus their teachers and families, and hopefully instil marine conservation issues into the teaching curriculum for future years. The 37 days of non-school events will reach at least another 20,000 people, and the web resources are freely available to all.

The Cool Seas Roadshow in a primary school in Devon

Reporting Schemes for Public Sightings of Marine Wildlife

The Marine Conservation Society (MCS) is lead partner for a range of BAP species – including basking sharks, marine turtles, jellyfish, pink seafans and fanshells – which are difficult and expensive to survey and monitor scientifically. Therefore, we operate very successful reporting schemes for public sightings, and regularly analyse the data. The resulting reports significantly increase our understanding of these endangered, rare or vulnerable creatures, and help to identify areas where protection and management

Educating the next generation

measures may need to be taken to protect species from harm. For example, since the start of the MCS *Basking Shark Watch* project, in 1987, we have received over ten thousand public sightings records, with dramatic increases over the last three years. This data was pivotal to our successful 2005 proposal for listing of the basking shark on the Bonn Convention for Migratory Species, and to changing the route of a powerboat race, around the Isle of Man, in 2005.

The *Cool Seas Roadshow* funding supports the promotion of MCS sightings schemes, and has allowed us to produce a new print run of awareness-raising posters, ID-guides and sightings forms, as well as updating the web-based reporting form, which is proving increasingly popular (570 basking shark sightings reported online, for 2006, to date).

Providing Advice on Marine SAPs and HAPs

For the final work program, within the *Cool Seas* project, MCS is providing expert advice, to England-wide local and regional BAP practitioners, on implementation of marine SAPs and HAPs. The project has already facilitated the marine day of the LBAP Conference in Liverpool, on 7 December 2006, where UK BAP practitioners shared their experience in a range of workshops, including data access and resources, information and networking, and stakeholder participation.

MCS is working on a comprehensive, full colour manual, providing the latest data on distribution of marine BAP species, and local actions required to meet SAP and HAP targets. The manual will also encourage a better reporting strategy for marine BAPs.

The *Cool Seas Roadshow* is part-funded by the Countdown 2010 Biodiversity Action Fund, administered by Natural England on behalf of Defra.

Coastal Management Issues in the Republic of Ireland

Richard Nairn CEnv MIEEM
Managing Director, Natura Environmental Consultants

The Irish coast is longer than the Amazon River and longer than the coasts of many European countries with much larger land areas. For a small island nation, where no-one lives more than 100 km from the sea, the coast is a vital interface with the other 90% of the national territory – the sea. It is also one of the most neglected and mismanaged resources in the country.

Coastal Zone Management

In 1997, a major study was commissioned by three government departments and the results were published as a draft Coastal Zone Management (CZM) policy for Ireland. The report drew attention to the fragmentation of administrative responsibility for the coast among numerous agencies. Regrettably, the Draft CZM Policy was never fully adopted by the government and its recommendations remain just that – recommendations. Among the local initiatives that 'got off the ground' at that time was the Bantry Bay Charter – an agreement between all the various stakeholders in a large marine inlet in west County Cork. However, after several years of innovative work to resolve many of the typical conflicts that arise on coastal sites, the Government ended its funding of the project, which could not then continue.

Coastal protection

In 2006, the Department of Communications, Marine and Natural Resources, announced a total of over €5 million for coastal protection around Ireland. In June 2006, the Marine Minister, John Browne TD, announced that: 'the coastal protection programme aims to construct works that slow or even halt the process of erosion in places where the coastline is at its most vulnerable'. In August, the Minister stated that further funding would 'ensure that vital coast protection work can be undertaken and potential damage from the vagaries of our Irish winter averted'.

Coastal erosion has long been regarded as 'an act of natural vandalism' to be combated like an enemy. Much of the protection work carried out in the past involved the use of relatively simple hard engineering structures such as groins, gabions, rock or concrete armouring but now, for the first time, there are signs that 'soft' ecological techniques were being considered, perhaps for reasons of cost if nothing else.

In 1997, an initiative by the late Professor Bill Carter of the University of Ulster with the Department of Marine, and supported by the EU Life Programme, produced a code of practice called Environmentally Friendly Coastal Protection (ECOPRO). Essentially, this is a comprehensive handbook for coastal managers with practical techniques for dealing with particular coastal management problems and avoiding inappropriate responses. It includes ecological solutions such as beach nourishment, dune-beach conservation and restoration of natural erosion buffers.

Rural beach management

Fortunately, some alternative strategies in beach and dune management have been pioneered by the University of Ulster, in collaboration with Donegal County Council. A recent project, in beach-dune sites around Co. Donegal, on the north-west coast, involving the local communities and also funded by the EU LIFE programme, has produced some valuable results. It has prepared beach and dune management plans for seven sites from Culdaff on the Inishowen peninsula to Rossnowlagh in Donegal Bay. It found that effective management must be based on accurate scientific information such as sediment type, wave processes and knowledge on the historical trends in coastlines as derived from early maps and air photographs. The resulting publication, (McKenna, J., MacLeod, M., Power, J. and Cooper, A. (2000) *Rural Beach Management: A good practice guide*. Donegal County Council. Lifford) is available as a downloadable pdf at www.heritagecouncil.ie/marine/publications.

Other beach-dune areas around Ireland are the subject of a new approach to coastal protection. In 2005-06, Waterford County Council commissioned the Coastal and Marine Resources Centre (CMRC) and the Department of

Brittas Bay
Photo: Richard Nairn

Narin Dunes Excavation
Photo: Richard Nairn

Geography at University College Cork to review coastal protection at Tramore on the south coast. The objective of this study was to make recommendations to assist with contemporary coastal management issues at Tramore and to provide suggestions for future research programmes required to develop an overall management strategy for the site. In order to achieve the main objective, to make management recommendations and suggestions for the direction of any future investigations, it was necessary to:

1. assess the current usage patterns, the views of relevant stakeholders and review the current condition of the Tramore coastline;
2. complete a desktop review of the available documentation to assess the effectiveness of previous shoreline protection measures; and
3. compile all the relevant datasets for Tramore into a readily accessible central resource and then utilise these to assess recent coastline change.

At Brittas Bay on the east coast, Wicklow County Council commissioned NATURA Environmental Consultants to set up a long-term monitoring programme to evaluate the coastal erosion control measures which had previously been implemented at this popular beach-dune system. This study shows that the central parts of the dune front (between the North and South Car Parks) have remained relatively stable since 1995. The southern end of the dune system has experienced a major cutback due to marine erosion in the last decade removing most of the foredunes which built up since the 1960s. By contrast, the extreme northern end of the dune system has been growing in a seaward direction with the addition of vegetated embryo dunes. Overall, the recovery of dune vegetation in the main visitor areas since the major erosion of the 1960s is adequate to prevent unnecessary loss of amenity while still maintaining some mobility of sand in the beach-dune interface.

In June 2006, Minister Browne announced that he had also commissioned a major new strategy review to, 'determine future priorities in the area of coastal protection and how to best allocate resources to ensure the preservation of our coastline and achieve better value for money for taxpayers'. This must be an appropriate time to assess how effective is the traditional engineering approach in the context of a rapidly rising sea level and the increase in storminess which is widely predicted on our coasts.

Monitoring ecological change on the coast

Mayo Sandy Beach
Photo: Richard Nairn

Much of the coastline of the Republic of Ireland is covered by European designations such as Special Area of Conservation (SAC) and Special Protection Area (SPA) and the Government agency, the National Parks and Wildlife Service (NPWS) began a major monitoring programme in 2004 to determine the conservation status of coastal dune habitats which are listed in the EU Habitats Directive (Annex I). Approximately 750 km of the national coastline is sandy habitat ranging from beaches and strandlines to fully developed dune complexes. As this is a complete national survey it also covers areas outside designated areas, so the results will help determine the effect of site designation on conservation status. The NPWS is also running a saltmarsh monitoring project which follows similar methodologies. A total of 30 saltmarsh sites have been monitored and it is hoped to extend this to 130 sites by 2008. This will represent over half of the national saltmarsh resource and sites have been chosen to reflect ecological and geographical variation. The national assessment of these habitats is due for submission to the EU Commission in June 2007, as part of the reporting obligations under the Habitats Directive.

With the formation of an Irish section of IEEM there is a new impetus now to raise the status of the profession of ecology and environmental management. Ecologists are now working in many local authorities, government departments and in the private sector and so the issues of coastal management will not be dealt with solely by engineers in future.

Richard is also the author of a recent book entitled Ireland's Coastline, reviewed on page 39.

Coastal Issues on the Isle of Wight

Louise Forder AIEEM
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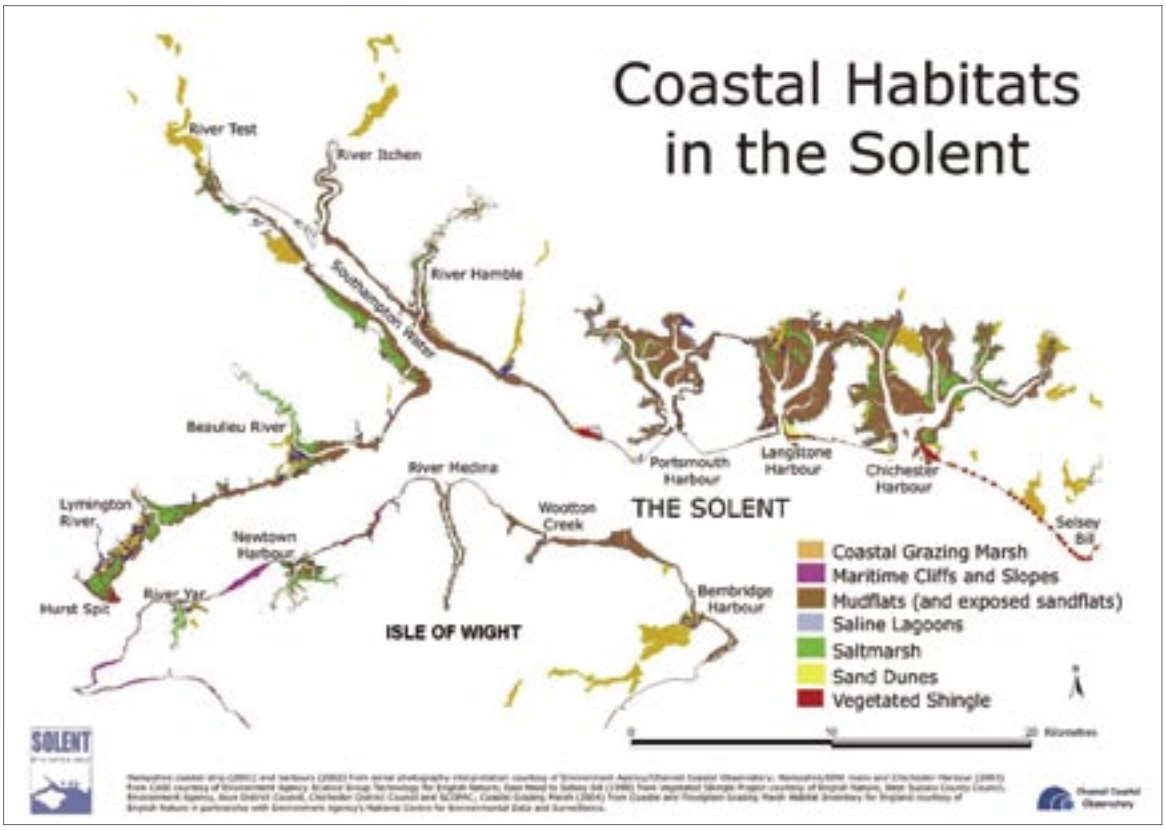
The Isle of Wight is internationally significant for its coastal ecology and nature conservation value. Other attributes include the island's varied geology, geomorphology and landscape. The coastal habitats are ecologically rich and diverse, with an extensive range of flora and fauna important at a regional, national and international level.



The extensive diversity of the coastal habitats and the species they support is largely due to the Solent's sheltered location at the convergence of the warm 'Lusitanian' waters of the Western Channel and the colder 'Boreal' waters of the Eastern Channel. A number of marine flora and fauna exist on the island at the peripheries of their UK geographic distribution; this is largely attributed to their location within the Solent[1].

The Isle of Wight is also of great national geological significance due to the presence of the extensive chalk cliffs and landslips. The 53 km of maritime cliffs and slopes frequently support rich and specialised fauna and flora, a large proportion at the northern limit of their range. Landslides sustain exposed environmental conditions that allow rare micro-habitats to develop that support a range of invertebrate species adapted to this rare environment. A study is currently underway to identify the key issues that would relate to the designation of part of the Isle of Wight coastline as either a 'World Heritage Site' or a 'GeoPark'.

Culver Cliffs, Sandown

Conservation Value

Most of the Isle of Wight's 110 km coastline is designated for its conservation value. The majority of the coastal and estuarine habitats of biodiversity value are covered by Site of Special Scientific Interest (SSSI) designations down to the mean low water mark. Furthermore, many are designated through the Unitary Development Plan as Sites of Importance for Nature Conservation (SINC). A large area of the Newtown estuary has also been designated as a National Nature Reserve (NNR).

A large proportion of the coastal environment, principally the estuaries, saltmarsh, lagoons and those areas of importance for bird populations, are afforded additional protection under designations such as Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar Sites. The network of European designations within the Solent region is collectively known as the Solent European Marine Site.

A large proportion of the Island's southern coast lies within the South Wight Maritime SAC designated for its subtidal reefs, vegetated sea cliffs and sea caves. The reefs are considered to be some of the best examples within the UK. A number of the most significant subtidal British chalk reefs occur at this location, representing over 5% of Europe's coastal chalk exposures, including examples at the Needles, Culver Cliff and Freshwater Bay. The sea cliffs are representative of one of the most extensive lengths of naturally-developing soft cliffs in the UK.

The Solent and Isle of Wight Lagoons SAC includes 36.24 ha of intertidal

Western Yar mudflats

habitats and coastal lagoons. The coastal ecology of the lagoons is extremely diverse, and is noted for the high number of nationally scarce starlet sea anemones. The Solent Maritime SAC is designated for the mosaic of habitats that include sea inlets, mudflats, sandflats, saltmarsh, lagoons, estuaries, shingle and sea cliffs. It encompasses a major estuarine system with four coastal plain estuaries and four bar-built estuaries. The site comprises the only location where the smooth cord-grass *Spartina alterniflora* exists in the UK.

The Solent and Southampton Water SPA is of European and national importance for wintering waterfowl and breeding seabirds, including gulls and four species of terns. The site includes a number of estuaries and harbours with extensive mudflats and saltmarsh areas. The adjoining coastal area comprises saline lagoons, shingle beaches, reedbeds and grazing marsh.

The Solent and Southampton Water Ramsar site comprises estuaries and adjacent coastal habitats including intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland, and grazing marsh. These support internationally important numbers of wintering waterfowl, important breeding gull and tern populations, and an important assemblage of scarce invertebrates.

Coastal Issues

The island has many coastal issues that are brought about by factors that promote coastal change, and these in turn have implications for the island's coastal ecology. The key coastal issues on the island include the processes of coastal erosion, landsliding and sea and fluvial flooding. These are a result of coastal processes, geological controls, climate change and sea level rise (SLR).

Undercliff Drive landslide

Coastal Erosion

The island is subject to significant coastal erosion, instability and landsliding, with much of the coastline comprising a number of widespread cliff and landslide formations. The Ventnor Undercliff is on the island's south coast and is the largest urbanised landslide system in North West Europe. Landsliding processes act to readily degrade the soft rock that comprises a large proportion of the coastline.

Widespread recession of the Mean High Water (MHW) affects around 69% of the coastline and ultimately leads to the loss of the majority of the shoreline sediments that are yielded by cliff erosion. However, it should be noted that sustained natural accretion has indeed resulted in considerable seaward advances of the MHW, for instance, at Ryde Sands and some inlets[2]. The dynamic stability of many of the Isle of Wight's beaches is now dependent upon the continued sediment inputs from the eroding cliffs.

It is important to note that although natural erosion and coastal processes

are significant for maintaining a number of coastal habitats, the Solent Coastal Habitat Action Management Plan[3] highlights that the continuing erosion of foreshores and die-back and erosion of cordgrass (*Spartina*) saltmarsh will leave upper foreshores, cliffs and coastal defences progressively more exposed.

Climate Change and Sea Level Rise

Climate Change has significant implications for flooding and coastal erosion issues on the island. These impacts are well documented and include sea level rise (SLR) and increased severity of coastal storms.

The updated Defra SLR allowances[4] were released in 2006; the previous 6 mm/yr has been replaced by a new variable allowance over time (4.0 mm/yr to 2025, 8.5 mm/yr between 2025 and 2055, 12.0 mm/yr between 2055 and 2085, and 15.0 mm/yr ahead of 2085). The updated figures now reflect an exponential curve, replacing the previous straight line graphical representations. Although the scale of these trends is still uncertain, the overall result of this relative sea level rise is the landward movement of both low water and high water marks. The time scale of coastal defence strategies have now been extended from 50 to over 100 years in order to respond appropriately to the potential threat and uncertainties associated with climate change. Defra have recently (November 2006) published new guidance advising that new coastal defence measures must be adaptable to the effects of climate change and SLR. The next UKCIP (UK Coastal Impacts Programme) scenarios are due in 2008.

Coastal Squeeze

Sea Level Rise can result in a phenomenon referred to as 'Coastal Squeeze', whereby habitats such as intertidal muds and sands, shingle and saltmarsh become trapped between rising sea-levels and fixed seawalls. The fixed structures act to avert the landward movement of habitats within the variable tidal prism reducing the affected habitats' area. This process exacerbates the direct effects of erosion. Loss of coastal saltmarsh is primarily attributed to coastal squeeze; saltmarsh is of significant value to the Isle of Wight where it comprises a key feature of the Solent and Southampton Water SPA and Solent Maritime SAC. Although many saltmarshes in the Solent are considered to be of recent origin (generally less than 120 years old), some on the Island, principally in parts of the Newtown estuary, are believed to be much older. The native, small cord-grass (*S. maritima*) found in the Newtown estuary is the only remaining site in the South East. Based on the Isle of Wight Evolution and Mapping Study assessment of habitat losses from designated sites, the Isle of Wight Mitigation Strategy[5] estimates that in the next 50 years, 5 ha of habitats that lie within the Island's Natura 2000 sites will be lost as a result of coastal squeeze.

Managed realignment that accommodates saltmarsh and mudflats is regarded as one of the only sustainable solutions to SLR. The IOW Mitigation Study has identified potential sites for realignment and habitat creation around the Isle of Wight coastline in order to compensate for losses of designated habitats due to any impacts of development proposals and coastal squeeze. In 2005, Defra released policy guidance 'Coastal Squeeze Implications for Flood Management' to ensure consistency with the requirements of the European Birds and Habitats Directives. The Eastern Yar valley might appear to provide the greatest resource (up to 600 ha) within the Solent area[5]. However, it is likely that coastal realignment may result in the loss of nationally and internationally important freshwater and brackish habitats. Defra highlight the need to secure compensatory requirements to protect the coherence of Natura 2000; the mitigation study recognises that it would therefore be vital to secure significant areas of floodplain land in the upper catchment from the SSSI, SPA, Ramsar sites to allow the creation of new grazing marsh habitats. The Solent Dynamic Coast Project is the sister project of the IOW Mitigation Study and covers the stretch of coastline between Hurst Spit and Pagham Harbour. Such studies aim to quantify coastal squeeze.

Coastal Management on the Isle of Wight

The three year RESPONSE Project 'Responding to the risks from climate change' was completed in December 2006. The project developed a regional-scale methodology for coastal evolution and risk mapping, taking account of the impacts of climate change. The key aim was to identify sustainable strategies to assist local authorities with the management of natural risks in the coastal zone. An International Conference on 'Landslides and Climate Change - Challenges and Solutions' is to be held on the Isle of Wight later this year (21-24 May 2007). This will allow individuals concerned with natural hazards and coastal change to meet and exchange research findings and methods of good practice. It will also provide the opportunity for concerned professionals to discuss solutions to climate change and geohazard challenges.

Long-term coastal defence policies have been developed in the Isle of Wight Shoreline Management Plan (1997). They address coastal issues (described above), and consider factors such as the geological structure of the coast, the natural processes which influence it, the

land use in the area, development plans and the flood and erosion risks along the coast. The plan is implemented through a number of Coastal Defence Strategy Studies that have been funded by Defra to identify appropriate coastal defence scheme types, establishing a preferred approach taking account of technical, economic and environmental factors. A Coastal Defence Strategy Study has been completed for the north-east coast of the Isle of Wight, and others are nearing completion for Sandown Bay and the Undercliff and the West Wight. Furthermore, the Eastern Yar River and Coastal Defence Strategy Study commenced in 2006 to assess the potentially increasing flood risks within the catchment as well as coastal erosion and risks of coastal flooding, looking ahead for the next 100 years.

By 2008, the overall strategic management of the Isle of Wight will be outlined in an updated Shoreline Management Plan (SMP), supported by the four Strategy Studies. The Isle of Wight Shoreline Management Plan Round Two will commence shortly and will provide a longer term view over 100 years including a more comprehensive consideration of the implications of coastal evolution, climate change and SLR in shoreline management. The strategies developed will be economically justifiable, technically sound and environmentally sustainable, and each will be agreed by the coastal agencies (including Isle of Wight Council, Environment Agency and Natural England) and through public consultation.

The Coastal Defence Strategy Studies pay due regard to UK Planning Policy, notably the recent Planning Policy Statement 25 (PPS25): Development and Flood Risk[6] which advises local planning authorities on how to manage flood risk as part of the planning process. PPS25 notes that the policies identified complement the framework of other Government policies for flood risk and water management, including the emerging Water Framework Directive[7] guidance.

A number of the Isle of Wight Coastal Defence Strategy Studies require a Strategic Environmental Assessment (SEA) and an Appropriate Assessment (AA) to be undertaken. The EC Directive (2001/42/EC) referred to as the 'SEA Directive' is a mandatory requirement for certain plans and programmes which are likely to have significant environmental effects. Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora requires an Appropriate Assessment (AA) to be undertaken to assess the impacts of a plan against the conservation objectives of a European Site and to ascertain whether it would adversely affect the integrity of that site. The Habitats Directive requires the application of the precautionary principle to sites that are afforded protection, whereby a project will only be permitted if there is no impact upon the site's integrity. Although the SEA considers the findings of the environmental report, unlike the AA, it does not advocate how the project should respond as a result of the assessment.

Western Yar saltmarsh

Conclusion

The Isle of Wight is of high value as a study area due to the existence of such diverse environmental conditions. As discussed, the implications of coastal processes and climate change for the island's coastal ecology present a very real challenge. Coastal management recognises the island's international significance and as such, aims to ensure that future climate change scenarios and sea level rise predictions are taken into account.

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Obstacles to Independence – the Case of MMOs in the Offshore Seismic Industry

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Sperm whale and rig
Photo: Simon Mustoe

Stringent conservation regulation is a relatively new phenomenon for the offshore oil and gas exploration industry who are now forced to adapt to the challenge of regulations in a highly uncertain environment. In difficult and often adversarial working conditions, ecological consultants struggle to maintain independent professional standards.

Only in 1999 did the United Kingdom High Court issue a ruling that Council Directive 92/43/EEC and the Conservation (National Habitats etc.) Regulations 1994 applied to distances beyond 12 nautical miles (Nm) off the coastline, extending statutory control to 200 Nm. Prior to this, conservation regulation of the offshore oil and gas exploration industry was relatively weak, as it occurred outside waters believed to be controlled by the legislation.

Remoteness, large three-dimensional area and lack of baseline data means the challenges are greater than we commonly face onshore. Differences in the scale of the problem however, are not the focus of this article. The principles of ecological consultancy remain the same: the difference being that offshore industries are just learning to accommodate regulations and uncertainty, when industries onshore have been tested for many years.

Here I discuss management of compliance in the regulation of noise impacts from seismic exploration and implications for the professional standards of ecological consultants working in the field.

The problem

Seismic vessels tow equipment designed to trigger the release of high-pressure air underwater. This creates a sudden large-amplitude and low-frequency compression wave to propagate artificial seismic vibrations in the earth's crust. Sound received back at the surface by thousands of hydrophones render a three-dimensional image of its geology. The object is to identify features that may contain oil and gas but a side-effect is very loud underwater noise.

There has been growing concern about the impact this might have on marine wildlife, particularly marine mammals that depend on sound for socialising, prey-finding and possibly navigation. Research indicates the potential for impacts to be significant and it was the Joint Nature Conservation Committee (JNCC) in Aberdeen that first developed policy to control some of the effects. Similar schemes have since been adopted around the world but all follow the same basic premise that is, to identify the presence of an animal within a predefined distance and to limit / stop seismic noise activity during operations when an animal is close.

Stricter regulations followed with the need to ensure visual monitoring of animals was effective and that data corresponding to regulatory requirements was gathered rigorously. Naturally, training was desirable and a number of exemplary schemes emerged, including the JNCC Marine Mammal Observer (MMO) accreditation scheme which teaches MMOs how to record data for the jurisdiction.

MMOs have a specific regulatory compliance role and every stop-work decision they make costs tens of thousands of

dollars. This article is not concerned with the content of accreditation schemes but instead looks at the MMO working environment. It explores whether, formally trained or not, MMOs receive necessary peer-support to satisfy professional standards for ecological consulting.

Humpback whales
Photo: Jim Thompson

The working environment

MMOs often work alone in a stressful and occasionally adversarial working environment, with little mainland communication. Being an MMO in the first place demands a thick-skin, good sense of humour, a very high level of professionalism and a well-balanced nature. There are few areas of ecological consulting where the pressures on an individual are brought to bear quite as strongly.

Seismic exploration vessels are usually run by a geophysical contracting company with a crew of technicians and mariners, some or all of whom may be sourced from their own staff or from one of a number of independent agencies.

Seismic exploration projects can be done by geophysical contractors themselves but more commonly by commission from oil companies. Geophysical contracting crews are usually awarded performance bonuses based on 'getting the job done quickly' and oil companies recognised many years ago that this was not conducive to a scientifically rigorous and safe working environment. It is common to find Client Representatives on board to ensure quality control. Where present, Client Representatives are a skilled and valuable point of contact but despite their experience, cannot take responsibility for the MMO's work. There is an inherent expectation that MMOs would control the actions of other contractors, in order to indemnify themselves and their clients. This is no different to any consultancy where various third-party pressures may inhibit outcomes. The consultant will be expected to do all they can to avoid this through intervention and dialogue.

Decisions by MMOs are expected to be challenged, as mistakes bear high cost-implications. The problem is that MMOs often have seconds to make a judgement before the evidence disappears below the sea-surface and, although domestic policy on seismic operations is well-developed, novel scenarios are common. The MMO has to be able to think quickly and give accurate on-the-spot advice. Success depends to a large extent on their qualifications as a consultant, their experience and their personality.

The situation is also unique in that MMOs are often, but not always, relatively inexperienced mariners. Crew that are highly trained and spend their lives at sea may not regard MMOs as contributing to a safe and smooth operation. Whatever regulations may exist, there is a maritime chain of command, at least the spirit of which must be adhered to.

In a hypothetical scenario, where the vessel is owned, operated and crewed by a contracting firm, all decisions by anyone, including the MMO, can theoretically be vetoed by the Captain. If the contractual framework for the vessel omits to highlight the over-riding need to comply with instructions, the MMO can find it very difficult to enforce the rules, being relegated to a lower-order of command.

The MMO can also find it difficult to perform if seen to have acted inappropriately or inconsistently on one or more occasion *e.g.* when a previously unforeseen situation requires an interpretation of 'soft' regulations. The MMO will usually be looking to apply the most precautionary interpretation but the Chief of Seismic Operations (the Party Chief) can over-rule a decision.

Out at sea
Photo: Simon Mustoe

These situations occur regularly and even when the MMO is contracted to an oil-company commissioning the vessel, depending on how much support they get from the client or Client Representative. The extent to which an MMO can be expected to achieve compliance objectives is therefore limited not only by their skills and experience but also the terms of their contract, scope of works and the agreed chain of command on board the vessel.

The consequences

There are few individuals prepared to spend long periods of their lives at sea as MMOs. Traditionally, the task has fallen to individuals who offer no other services and so depend on their unique skills for a living, or to people

Common dolphins
Photo: IWDG/Pádraig Whooley

working an occasional shift during gap years or between other onshore jobs.

Unfortunately, MMOs without the wider skills to meet demands from client and contractors and who find themselves unable to confidently support their actions, risk jeopardising the profession's standing. If contractors intervene to negotiate 'tricky' decisions the value of having MMOs on board is called into question. But it would be unfair to blame MMOs for this problem, since it also occurs due to interference by seismic crew, who are not expected to understand the risks and liability issues. Nevertheless, MMOs who then stand up for high standards, find their livelihood threatened. Crew and contractors usually expect minimum standards to be applied. Any deviation from what they may have experienced on a previous project (even if this was in a different jurisdiction) will be viewed as an unnecessary burden and obstacle to timely operations.

The consequence is that any company wishing to demonstrate due diligence, cannot reliably do this by simply contracting an independent MMO, as there are too many conflicts of interest. The situation has evolved partly through lack of insight by the regulators but also by industry and the MMO profession, which has been hasty to adopt prescriptive compliance standards, without considering how these will be implemented in the working environment. One may go as far as to say that exponents of the profession have never considered MMOs as practising ecological consultants. The view is perhaps that their role is limited to simple monitoring and 'accreditation' provides the necessary professional assurances.

The solution

The challenge now is to find a way to ensure that accredited MMOs are empowered to perform at their discretion, fairly and without prejudice, and that the integrity of their independence is maintained in all projects. This requires a careful look at client-MMO contractual responsibilities and incorporation of flexibility to cope with unexpected situations.

There is a need for policy to ensure that professional standards of best practice for MMOs, as ecological consultants, are agreed by client and contractors upfront. This could be done for instance, by promoting the application of a Code of Conduct as binding in project approvals or client-contractor documents.

Legislation should reflect the need to ensure due diligence by taking reasonable advice given by MMOs. By return however, MMOs will need to be able to clearly justify their decisions and at present, many 'trained' MMOs are simply too inexperienced to do this.

So rather than allow inexperienced MMOs to operate alone, companies that provide their services could offer management support, with appropriate training in protocols agreed with the client in advance of the job. This is uniquely different from MMO accreditation. Companies operating a Quality Management System such as ISO 9001 would be expected to provide MMOs with a work procedure tailored to contractual demands. Where unexpected scenarios arise, the MMO should be able to make a judgement based on precautionary logic and, if necessary, debrief with the client to amend the approach, without reprisals. Unfortunately, even regulations in some parts of the world are too inflexible to encourage open reporting. When deviations from expected scenarios are treated as breaches of compliance by auditors, this will undermine transparency and progress. This situation must be avoided in all cases.

There is no reason why a relatively inexperienced but accredited MMO should not be able to work alone on board a vessel, as long as they are in regular contact with an experienced shore-based manager who can negotiate deliverables with the client. It is also desirable that they have at least one training shift on board a vessel with an experienced MMO before being allowed to work alone offshore. Established ecological consultancies may not understand why this is a problem, since it is hardly a unique approach. It is because established consultancies rarely provide MMOs – since training and accreditation delivers individuals, rather than companies. Herein lies the main problem with existing framework. Rather than focusing on just the individual, the framework needs a two-tier approach providing quality assurance in monitoring (by the MMO) and management (by the MMO provider).

There is as much need for control of MMO providers, as there is of MMOs and one need look no further than the professional standards of institutes such as IEEM for guidance on how this can be done. Crucially, the MMO service provider must have an exemplary knowledge of the specific approval conditions, general seismic vessel logistics and marine mammal behaviour, to be able to provide high quality advice. Many MMOs are simply provided by specialist human resourcing companies and others emerge from companies that may not have the expertise

to provide robust management support. Ultimately, it is the provider who must be responsible for the actions of MMOs and who are responsible for ensuring actions on behalf of a client are independent and defensible. If an MMO is to also act in the role of MMO provider (*e.g.* provide themselves), then they would have to be qualified for both roles.

Conclusions

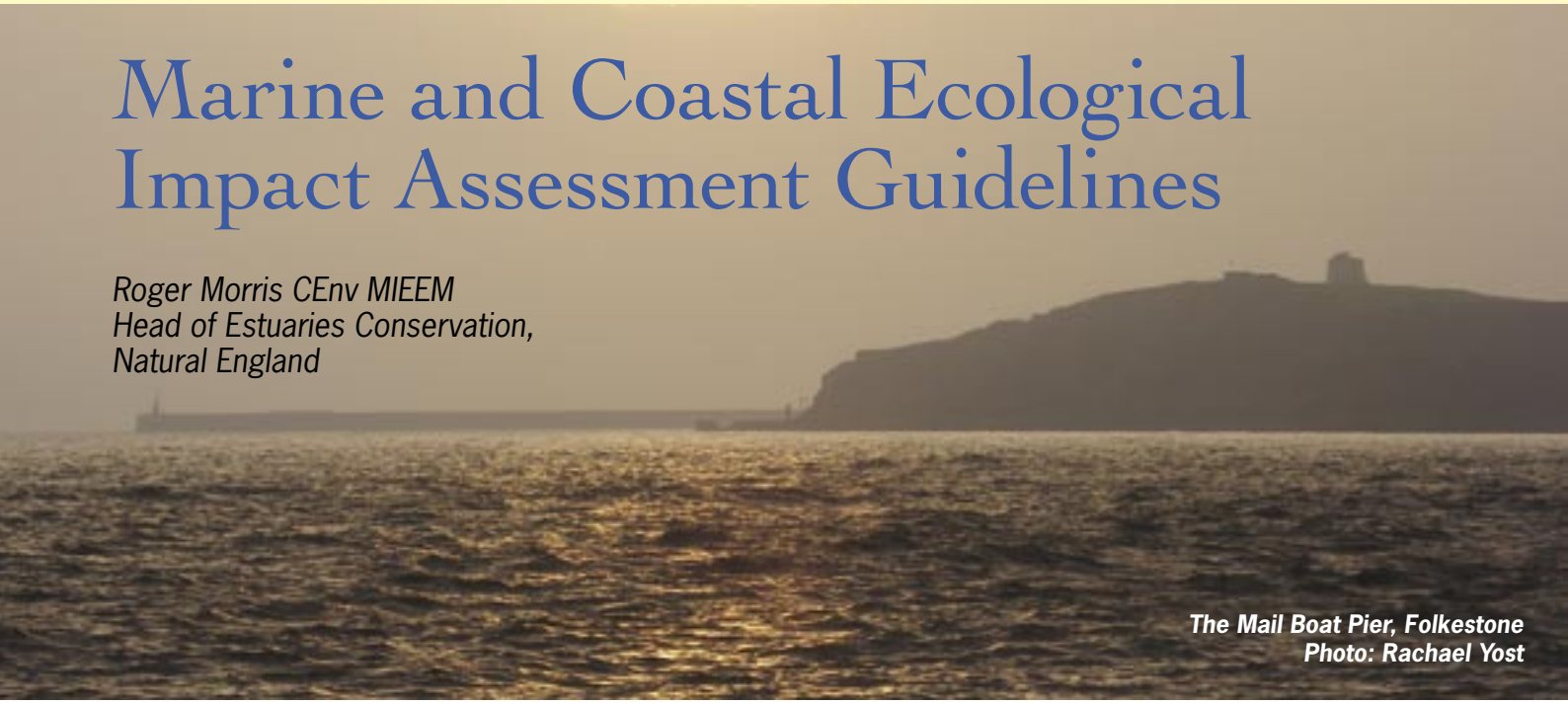
Regulators, industry and the ecological consulting profession, need to give careful thought to whether the current MMO framework provides the assurances needed to demonstrate due diligence. There is no doubt that it can but at present there is every sign it is failing, so the professional reputation of MMOs and their work standard is being seriously affected.

There is no doubt that existing MMO training serves a purpose of teaching aspects of the monitoring component. Provision of any ecological service however, carries a very high level of commitment to advice, management and most of all, independence. Training and accreditation processes are fine as long as the limit of experience and skills of individual consultants are recognised. Companies who provide MMOs and those who would use them, need to understand that their role carries an inherently high level of professional risk. To indemnify a client to the highest practicable degree, the professional consulting experience of an MMO needs to be considered, before deciding if they are also capable of managing a project. If not, a source company with appropriately skilled staff should be considered. Finally, a contractual framework that supports independence and transparent reporting, must be developed for each and every job, to account for the onboard relationship between MMO, client and third-party contractors.

MMOs at sea
Photo: Simon Mustoe

Marine and Coastal Ecological Impact Assessment Guidelines

Roger Morris CEnv MIEEM
Head of Estuaries Conservation,
Natural England



The Mail Boat Pier, Folkestone
Photo: Rachael Yost

Ecological impact assessment on land is well established and is serviced by a comparatively large number of practitioners, many of whom are IEEM Members and Associates. There are far fewer practitioners in the marine and coastal environment. Some of the skills and knowledge required are transferable to the marine and coastal environment, but there are many important differences. Consents frameworks largely fall to relevant Government Departments and not to planning authorities; projects are often extremely large-scale and very important in a national context, thus leading to high profile inquiries and ministerial decisions. Examples include renewable energy projects, pipelines and cables, fossil energy reserves, port development and approach channel dredging.

Management of marine organisms relies much more heavily upon natural processes, but many are severely affected by development pressures. The issues that predominate also differ; for example, terrestrial protected species are generally familiar to the public and capture their imagination whereas those in the marine environment are less well known and are frequently small and insignificant. The effective obscurity of marine organisms coupled with an 'out of sight – out of mind' attitude mean that their conservation generates comparatively little public sympathy and even less appreciation amongst developers. This means that in many respects attitudes towards impacts on the marine environment lag behind the terrestrial world.

Regulation of the marine environment is rapidly catching up with land-based systems, especially with the introduction of a variety of European Directives. Environmental Impact Assessment is now an accepted requirement for most projects although some still have to be captured through the forthcoming Marine EIA Regulations. Marine EIA is therefore comparatively specialised and undergoing a rapid learning curve. In their current state, IEEM's recently published Ecological Impact Assessment Guidelines do not adequately cover the issues likely to be encountered in the marine environment and therefore we have undertaken to publish separate guidance for the marine and coastal environments.

The Marine EcIA guidelines are now under development drawing upon a wide range of expertise. The steering group comprises: Patricia Almada-Villela, Polly Bown, Sally Edmondson, Mick Green, Tom Mallows, Roger Morris, Karen Nash, Tim Norman, Albert Nottage, Diana Pound, Graham Russell and Liz Sides. Linda Yost is the Project Manager.

We have learnt from the process that led to the publication of the earlier terrestrial EcIA Guidelines and of course benefit greatly from that project. The framework for the marine and coastal guidelines draws heavily upon existing guidance but will undergo a process of development with a first public consultation in September 2007.

Marina at Lymington
Photo: Linda Yost

Letter Concerning Biological Records Centres

Sir,

Following a recent experience whilst conducting a desktop study for a development I became curious to how the current Biological Record Centre (BRC) system is organised, administered and regulated. Having dealt with several different centres I have noticed an inconsistency in the quality of data presentation as well as the level of information offered and above all cost. For example one BRC was able to provide mapping as well as the data requested and included information on notable and protected species and County Wildlife Sites, whilst another provided a simple spreadsheet and informed me I had to go to the local Wildlife Trust (at further expense) for details of County Wildlife Sites. Both centres charged approximately £100 for these services. In further contrast a particularly good centre supplied a 12 page document with detailed mapping, pdf files with details of relevant County Wildlife Sites and extensive relevant spreadsheets of species records – all for under £80.

Whilst I understand the BRCs have no control over the quality of the data, my main concern is how the cost of such a service is calculated and regulated, especially as the revenue is being fed into local government coffers. It appears to be the norm to charge by the hour and two/three hour data searches are common. Being a user of the Recorder database and GIS software I am fully aware of how quick it can be to produce reports and question the length of time these requests take. This was recently confirmed when I received results back for one project under the two hours billed for!

Considering consultants are obliged to obtain these data, I feel the system is open to abuse and some consistency would be beneficial. I was wondering if my experiences reflect a wider situation across the country and those of other ecologists in my position. If this was to be the case I also ask the best way to proceed in improving the situation.

Yours faithfully,

Iain Bray AIEEM

Institute News

Who's who in IEEM 2007?

In previous years at about this time, I have listed the names and contact e-mails of members of Council and the various IEEM Committees. If you wish to raise an issue with a Council or Committee member, you will be most welcome to do so.

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Jenny Neff, Janet Swan, Alex Tait, Eirene Williams.

External Affairs Committee (EAC)

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Debbie Bartlett, John Box, Robin Buxton, Jon Capel, Greg Carson, James Gillespie, Paul Goriup, Daniel Gotts, Jenny Heap, Robert Rowlands, Stephanie Wray.

Membership Admissions Committee (MAC)

Richard Graves (Chair) richard.graves@fabermaunsell.com

Matthew Clarke, Héloïse Collier, David Collins, Claire Cornish, Toby Gibbs, Julian Jones, Paul Lee, Geraldine McGowan, Steve Pullan, Pat Rae, Lynsey Robinson, Sacha Rogers, Paul Rooney, Keith Ross, Stephen Trotter, Claire Wansbury, Fiona Wren.

Professional Affairs Committee (PAC)

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Tim Bines, Jacqui Green, Mick Hall, Tom Keatley, Lisa Kerslake, William Latimer, Hilary Ludlow, Stuart McAleese, Sue Swales.

Training Education and Career Development Committee (TECDC)

John Rose (Chair) j.c.rose@shu.ac.uk

Jonathan Benge, Debbie Court, Cameron Crook, Vicky Fletcher, Leila Griffiths, Alan Hopkins, Pam Nolan, Jon Panter, Sarah Pemberton, Peter Phillipson, Kathy Velander, Claire Vetori, Mark Webb, Mark Woods.

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Irish Section Committee

Mieke Muyllaert (Convenor) mieke@eircom.net

Sasha Bosbeer, Pat Doherty, Katherine Duff, Norma O'Hea, Richard Nairn, Paul Scott, Janet Slattery, Pascal Sweeney, John Wann, Faith Wilson.

North East England Section Committee

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Barry Anderson, Ian Bond, David Feige, Caroline Gettinby, Maria Hardy, Tony Martin, Steve Pullan, Glen Robson, Andy Westgarth, Jane Young.

North West England Section Committee

Paul Rooney (Convenor) rooneyp@hope.ac.uk

John Huckle, Jeremy James, Dorian Latham, Andy Whitfield, Liz Price.

Scottish Section Committee

Daniel Gotts (Convenor) daniel.gotts@scotland.gsi.gov.uk

Oyunn Anshus, Philip Baarda, Elaine Cameron, Katherine Degenaar, Julie Dewar, Rachel Hirst, Kathy Morduant, Sally Monks, Annie Say.

South West England Shadow Section

Matt Jones (Convenor) mattj@eadconsult.co.uk

Welsh Shadow Section

Chris Formaggia (Convenor) formaggia@btinternet.com

Steve Crosby, James Gillespie, Abbey Lee, David Parker, Fred Slater, Mike Willis.

IEEM on the Move

Negotiations are nearing completion on a move of the IEEM offices – next door to 43 Southgate Street, Winchester. It had not been envisaged that this would take place so soon but it is due to the unexpected availability of what appears to be a most suitable property. Council has supported this action after carefully considering the various options. This will allow for further expansion of the Institute as well as to provide for more secure tenancy conditions. The final agreement is still not assured but the move is expected to take place in late March 2007. Phone numbers and email addresses will be unaffected.

Professional Development Programme

The Professional Development Programme for this year is the most comprehensive yet but do book early to avoid disappointment. Some courses are already full.

IEEM and the Training Education and Careers Committee would like to record their gratitude to the many supervisors of the courses who have been involved in the programmes for this year and last year as, without their efforts, this significant part of IEEM activities could not happen.

Continuing Professional Development

Praise where praise is due! – There does seem to be a significant increase in the numbers of members completing their CPD – but this is by no means everyone. The need for CPD and demonstrating keeping up with the fast changes in our field is a clear obligation of the Code of Professional Conduct. The Professional Affairs Committee will be reviewing the statistics of those who have not returned their records shortly and for those who are still in breach of the Code, one approach being considered is the possibility that members' details now listed on the Commercial Directory and effectively endorsed by IEEM, will be removed.

Health and Safety - Lone Working

If you are looking for a 24 hour 365 days a year safety cover system to reduce risk associated with remote locations and lone working there is now a service available. If you are interested in this Health and Safety service for yourself as a sole trader or as IEEM members in a company please contact Linda Yost. The more members that take it up, the lower the overall costs will be for the individual.

IEEM Website

The External Affairs Committee and the Secretariat are currently considering how to update the IEEM website. This is a much used resource which has grown considerably during the last few years, but is now in need of a more modern appearance. Any suggestions as to what might be included on the site as it develops would be very welcome. One of the most frequent questions addressed to the Secretariat is how to gain access to the member's section. If you are unsure of this do please contact the office for further guidance.

Membership Issues

The renewal process is now over and once again there has been a very high rate of renewals. The many members who required two reminders and finally an email or phone call really ought to reflect on whether this exercise should be necessary and what it means for IEEM resources.

Please note that paying by Direct Debit is slightly cheaper and if you wish to pay by this means you can download the form from the members' section on the website. We need to have the mandate by 1 August 2007; so do make time to sort it out now.

One real success story of recent months has been the interest in the new Graduate Grade of Membership. Since the new regulations started on 1 October 2006, there have been over 100 applications for Graduate membership.

Council approved the idea that IEEM should seek to add value to being a member through offering other benefits. Many professional institutions do this and they typically comprise health schemes, equipment insurance or discounts, investment offers (e.g. ethical). The Institute will be examining how a portfolio of such benefits can be built up.

Consultations Update

EAC have responded to several consultations so far this year, namely:

Planning for the Protection of European Sites: Appropriate Assessment - Guidance For Regional Spatial Strategies and Local Development (DCLG)

Code of Conduct Statutory Instrument for Areas of Outstanding Natural Beauty Conservation Boards within England (Defra)

IEEM Conference Papers

The Papers for the Cardiff Conference should be available soon. They have been assembled and are currently being edited. We

aim to make the proceedings available to the delegates who attended the conference in a printed form and then on a CD-ROM for all members.

IEEM Conferences 2007

The programme for the Spring Conference - Developing Best Practice in Survey and Reporting - has proved to be extremely popular and the full capacity of 250 has now been reached. This is a record for an IEEM one-day conference. Apologies to any members who have been disappointed. The message has to be to get your bookings in as soon as possible.

The Autumn Conference is now scheduled to take place in Nottingham on 13-15 November and will be on the increasingly topical theme of ecological networks.

IEEM Section in the East Midlands

As the Autumn Conference will be held in Nottingham, it gives the opportunity to consider whether members in the East Midlands would like to have their own Geographic Section. The area of the East Midlands is defined as including Derby, Derbyshire, Leicester, Leicestershire, Lincolnshire, Northamptonshire, Nottingham, Nottinghamshire and Rutland. In recent years the Annual Conference has been an opportunity to launch a new Section. But this will only work if there is sufficient interest and enthusiasm within a particular area to make this happen so please consider whether the time is now right for this new Section. There are about 200 members in the area so that should be enough to be viable. We currently have sections in Ireland, Scotland, North East England, North West England, South West England, and most recently, Wales. But there is nothing to prevent members in any other area wishing to create their own section and you do not have to wait for the visit of the Annual Conference.

Launch of IEEM's 'What A Graduate Should Know' Guidance

The Institute has produced previous guidance for people considering a career in ecology or environmental management. However, in recent years it has become apparent that there is a shortage of people entering the profession with appropriate field skills. This guidance has been written so that anyone applying to universities will know the expected level of skill and knowledge of field skills expected of a new graduate. It is also hoped that course providers will consider this when reviewing their course content. The TECDC will be launching this document at the Spring Conference in April.

Skills Project

IEEM will soon be undertaking a large project looking at ecological skills provision and acquisition. This project will look in depth at the current provision and gaps in skills and what the Institute, and the sector as a whole, can do to make sure that people in this area of work have the right skills and knowledge.

News of Members

Congratulations to Philip Couchman, MIEEM on being awarded an MBE in the New Years Honours List for services to Conservation. Philip was until recently, Manager of the Chichester Harbour AONB and is now a Retired Member. He became a member of IEEM in June 1992.

Bye Bye Demon

Please note that the former IEEM email address of xxx@ieem.demon.co.uk is no longer operative and you may have had some messages returned. All emails now need to use firstnamesurname@ieem.net

IEEM Campaign on the Environmental Liability Directive

The transposition of the Environmental Liability Directive into UK law is due to take place on 1 April 2007. This has long been anticipated and there have been discussions on how this would be done for at least a year. There was a long hiatus between the early discussions and the final appearance of the Consultation document. This is a lengthy tome – 176 pages in all. IEEM has always held the general view that the opportunities to strengthen the protection of habitats, species and protected areas should be taken where these reasonably arise. It was therefore with some disappointment that it has emerged that the Government's preferred option is to do the minimum possible and to avoid any 'gold plating' during the transposition.

This disappointment was clearly shared by the RSPB and WWF and a number of other bodies. The RSPB's response was prepared by Sandy Luk and regardless of whether one would agree with every point, is a most solidly crafted and scholarly piece of work. IEEM has kept in close liaison with the RSPB as the situation has developed. IEEM has strong links with a number of professional bodies through the Society of the Environment and others that cover a related subject area. Contact was made with the Landscape Institute (LI), the Institute of Biology (IOB), the Chartered Institution of Water and Environmental Management (CIWEM), the Royal Town Planning Institute (RTPI), the Institution of Environmental Sciences (IES), The British Ecological Society (BES), the Zoological Society of London (ZSL), The Wildlife Trusts, the IUCN–UK Committee, some of which are understood to be making a response. One institution has modified its response after being made aware of the issues by IEEM. It is clear that the concerns felt by IEEM are shared by a number of those who have responded.

IEEM has been in contact with the three main political parties in England and various questions have been asked in the House of Commons. As far as IEEM is concerned, this is the first time that we have been so proactive on any issue – responding as we do to many consultations is one thing, but actively campaigning is rather different. This is an issue over which a professional institute does have to exercise some care. All IEEM members were circulated with a letter electronically, pointing out some actions that could be taken. The reactions I have had have been very positive, although one or two have questioned whether this is something we should be doing or whether any such effort was likely to produce results. On the latter point we shall have to see.

This has been an interesting exercise for IEEM staff, Jim Thompson and Jason Reeves and thanks are due to Robin Buxton and Tim Bines who kindly produced the IEEM response. It will be interesting to see if what appears to be substantial support from conservation bodies will alter the Government's preferences, or whether the CBI view, that is an unacceptable burden on British Industry, will prevail. IEEM has certainly done its part but with present resources, we will not be able to do so to this extent on many occasions.

The closing date for the consultation has been extended to 28 February 2007 in England, Wales and Northern Ireland but there is a separate consultation in Scotland, which closes on 23 March 2007.

Scottish Section News

Breaking into the Environment

The seminar at the University of Edinburgh on 25 January 2007 was held to help inform students of both what is involved in a range of environmental careers and how to get started on such a career. The event was chaired by Daniel Gotts, Convenor of the Scottish IEEM Section. The speakers were Heath Brown, Area Manager, BTCV Scotland, Katherine Degenaar, ecologist, ERM, and the Scottish Section Secretary, Alan Anderson, Conservation Operations Manager, Scottish Wildlife Trust, and Linda Pooley, Team Leader on Climate Change Policy, SEERAD – the team that is working to promote ways to combat climate change in Scotland. Over 200 students attended, keen to learn how to get that dream job in the ecological and environmental sector.

Each speaker gave the audience a taste of working life in the private and public sector with useful advice on how to get there. Emphasis on conservation volunteering opportunities were highlighted by Heath Brown and Alan Anderson, and everyone was strongly encouraged to get out there and acquire those practical field skills sought by many employers. Linda Pooley also applauded excellent team working and communication skills, and a willingness to grab new opportunities. Katherine Degenaar made everyone jealous sharing her experience of her diverse and challenging work with opportunities to work abroad, and highlighting that becoming a modern environmental professional can be financially rewarding as well as providing job satisfaction. She noted that a student IEEM membership would open doors for acquiring affordable practical field skills and look very good on the CV. Indeed, a table brimming with IEEM promotional material was quickly swept away.

Daniel Gotts chaired the discussion session at the end of seminar where the topic of the questions ranged from salaries, to volunteering opportunities and work possibilities for international students. Afterwards many used the refreshments session, offered with compliments from the University of Edinburgh Career Services, as a chance to quiz the speakers and to ask about the Institute. The response from students was very positive and many went away with a mission to get involved in ecological and environmental volunteering and to join the Institute.

Public Private Interface in the Environment

This evening event was of considerable interest and was attended by 30 delegates. Representatives from a range of organisations spanned the public, private and NGO sectors. The evening began with an interesting and stimulating address by Fred Edwards. Fred (President of Scottish Environment LINK, the umbrella organisation for Scotland's voluntary environmental organisations) opened the debate by introducing the topic of the interface among public, private and NGO organisations. He posed the question 'Does it matter that there is a wide gulf between green professionals?' Fred's opening remarks were met with wide agreement that in a world where we are struggling to safeguard the future of biodiversity, we cannot afford a lack of co-operation among environmental professionals. So how can we improve our working relations in order to achieve the optimum outcome for the environment?

An interesting discussion followed that explored the idea that one of our downfalls in the industry is that green professionals are often pigeonholed, creating an often artificial boundary between consultants, NGOs, Non-Departmental Public Bodies and the Scottish Executive. These boundaries and perceptions are quite commonly felt to propagate a perceived 'fear of engagement' between sectors, despite a wide appreciation that engagement is beneficial to all sectors, and most importantly, to the environment.

In discussion of how we might enhance the relationship between the public and the private in the environment, some of the main themes presented are outlined briefly below.

- IEEM has a role to play in encouraging discourse by acting as a liaison channel between organisations. This role will rely upon the Institute further developing its image as an Institute for all environmental professionals, and not primarily for consultants.
- Consultants and public sector representatives both welcomed continual discourse throughout the lifetime of a development, paving the way for consistent and effective post-construction monitoring.
- Secondments among NGOs, public bodies and the private sector were suggested as a method for increasing trust, understanding and conversation between the sectors.

The discussion of links between the environment and business, broadening the discussion to include issues relating to the environment and the wider business world, will continue at a forthcoming IEEM evening seminar. It is hoped that delegates from all sectors will join with representatives from the business world giving further opportunities to discuss linking the work of green professionals.

Thanks to those who attended, and to those who continued the discussions at dinner afterwards. An enjoyable and productive discussion was had by all and we look forward to continuing discussions at our next evening seminar, to be held in late March.

South West England Section News

Severn Estuary Partnership and Other Estuary Partnerships

South West England Section Meeting, 4 December 2006

Natasha Barker
Severn Estuary Partnership Officer

Established since the early 90's there are currently 50 or so estuary partnerships in the UK all of which are voluntary in nature and loosely co-ordinated through the charity CoastNet. CoastNet describes itself as 'an international networking organisation established in 1995 that works with all coastal interests to promote the exchange of ideas, information and expertise to find long term solutions to coastal problems that benefit all…'

Natasha explained that put simply estuary partnerships had originated in response to managing the increasing pressures on the natural resources that the UK estuaries provide and are grappling with the issue of achieving Integrated Coastal Zone Management (ICZM). What this actually means is a quite a good question, if the coastal zone is defined as the zone over which activities that effect the estuary extend, then the area could be huge. For example, holiday makers from the Midlands that travel down to Weston Super Mare every summer – it's a large area of influence.

As voluntary organisations with no statutory powers and limited funding Coastal Partnerships struggle in their ability to tackle the real issues facing our coastline, in many ways there are parallels to be drawn with the local biodiversity partnerships across the UK.

The Severn Estuary and its Partnership

The Severn Estuary has the second highest tidal range in the world and has one of the largest river catchments in the UK. Over three million people live around the estuary and over 80% of the shoreline is protected with flood defence structures. The estuary has a huge range of pressures upon it from industry and urban infrastructure, together with recreation demands from such a large population. Future issues to be faced by the Severn Estuary could include climate change, sea level rise, and proposals to create a barrage (for power generation) between England and Wales. The estuary is an incredibly beautiful place supporting internationally important species and habitats. I can see the Severn Estuary from my bedroom window (if I lean right out) and have a special fondness for the wintering wildfowl found along the Gloucestershire shore, I'm addicted to wild geese and bewick swans.

The Severn Estuary Partnership itself was established in the mid 1990s involving 14 local authorities, port authorities, three water companies, two statutory nature conservation agencies and a whole host of NGO's and local interest groups.

In their own words:

'the Severn Estuary Partnership is an independent, estuary-wide initiative led by local authorities and Statutory Agencies. We work with all those involved in the management of the estuary, from planners to port authorities, fishermen to farmers and many more.'

The Severn Estuary Strategy was launched in 2001, after several years of work developing concensus and agreement. It now provides a strategic management framework.

The Partnership brings people together to resolve problems and realise opportunities.

We currently:

- provide mechanisms to improve communication;
- encourage a partnership approach;
- are a focal point for research;
- highlight examples of good practice; and
- source funding for new projects.

The Partnership provides secretariat services for a number of groups, including the Joint Estuary Groups Initiative.

The Severn Estuary Partnership website is extremely informative and well worth a visit. http://www.severnestuary.net/sep/

Natasha gave a fascinating insight into the pressures faced by our estuarine systems and finished with images taken during a recent fellowship award visit to the Bay of Fundy in Canada. The Bay of Fundy has the highest tidal range in the world and is still largely untouched by man, a real wilderness gem and perhaps a source of inspiration for the future of the Severn.

For more information please visit www.coastnet.org.uk/?a=11.

Report by Mark Lang CEnv MIEEM
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IEEM SW Conference

The IEEM South-West Shadow Section intends to hold a one-day conference on the subject of:

'Marine habitats and impact assessment'

If you would like to present a paper at the conference or assist in running the event, please email Matt Jones (Section Coordinator): mattj@eadconsult.co.uk
It is likely that the conference will be in June and be held in either Plymouth or Exeter (more details to follow).

South West England Section News

Environmental opportunities on the farm

South West England Section Meeting, Taunton Library, 31 October 2006

Ben Thorne
FWAG

Ben Thorne of Somerset FWAG presented on Environmental Opportunities on the Farm.

The past 20 years has overturned much of the post-war production agenda that had excluded environmental considerations, to a recognition of farming having a role in maintaining the rural landscape. Reduced commodity prices had helped encourage the uptake of environmental projects and contributed to reduced cultivations. The approach had also shifted from single-site environmental projects to the whole-farm approach, but different farmland habitats presented different opportunities and challenges. There is a need to consider the whole-farm environment; thus soil management solutions may include rough seedbeds, timing of operations, cropping patterns and nutrient planning and safe spreading. There are also emerging opportunities e.g. in relation to new energy crops.

Summary by Alan Hopkins CEnv MIEEM

Reintroduction of the beaver

South West England Section Meeting, Taunton Library, 31 October 2006

Derek Gow
Independent Consultant

Derek Gow presented on the potential for reintroduction of the European beaver to lowland rivers.

This once highly valued animal is believed to have become extinct through over-exploitation, not because of it having a pest status. It may have survived into the 19th century in isolated numbers. Some compelling arguments were made for its role in improving wilderness values and regulating peak river flows. It was argued that the potential for adverse impacts from these vegetarian rodents would be minimal. Britain, apparently, is one of the last few countries in Europe where it formerly occurred that is not to be seeking to reintroduce it. Why not ? - many were left wondering.

Summary by Alan Hopkins CEnv MIEEM

RSPB Wessex Stone-curlew Recovery Project

South West England Section Meeting, Trowbridge, 4 December 2006

Phil Sheldrake
Wessex Stone-curlew Project Manager, RSPB

The RSPB has had conservation projects for stone-curlew (*Burhinus oedicnemus*) in Wessex since 1985, and have implemented a Species Recovery Project since 1995. The Wessex Stone-curlew Recovery Project has been a great success: numbers of breeding pairs have increased from less than 30 pairs in 1985, to 116 pairs in 2006. This has contributed to beating the UK BAP targets in 2000 and to achieving the 2010 target (300 pairs) five years early!

The decline in stone-curlews since the 1920s is attributed to the large scale loss of grassland and changes in farming practices. These have reduced the availability of habitats with sparse vegetation and minimal disturbance needed for nesting sites, and of insect-rich feeding sites. Also, the population is slow to expand its range, being site-faithful when returning to breed.

The Wessex Stone-curlew Recovery Project works closely with farmers to create conditions conducive for completing the nesting cycle, by:

- protecting nests and chicks from disturbance by farm machinery;
- creating and managing safe nesting habitat (managed set-aside/fallow) using Stewardship scheme funding;
- managing crops near the nests to provide suitable feeding habitat;
- surveying for nests, monitoring breeding attempts and autumn roosts; and
- measuring the success of the project through a colour ringing programme and subsequent re-sighting to determine productivity.

Phil Sheldrake stated that the success of the Project was largely down to the commitment from Wessex farmers in seeing the stone-curlew population thriving. The future challenge to ensure that this excellent success story continues is to put in place a mechanism for creating suitable habitats in both semi-natural habitats and farmland to facilitate a self-sustaining population.

Summary by Katie Born AIEEM
Environmental Scientist, Halcrow Group Ltd

North West England Section News

Moving on

The North West England Section of IEEM has taken a great stride forward since the last edition of *In Practice*. It has moved from being a 'shadow' Section and is now formally constituted. This was done at its first AGM hosted at Manchester Metropolitan University on 11 December 2006. The meeting was attended by about 50 members, plus students from several Universities. A Section Committee was voted in comprising Jeremy James, Dorian Latham, Andy Whitfield, Liz Price, Jon Huckle and Paul Rooney as Section Chair.

Following the formal business of the AGM led by Linda Yost, we were honoured to receive a short address recalling the history and purpose of the Institute from one of our Fellows, Professor Tony Bradshaw. Tony went on to introduce the guest lecture delivered by Professor Penny Anderson.

Speakers from the Geodiversity workshop as mentioned in the report. Left to right are Paul Rooney, Jonathan Larwood, Cynthia Burek, Kevin Crawford and Murray Gray.

Penny shared her special expertise on moorland assessment with us. In a substantial and provoking address she described how twenty years ago we all did moorland surveys, then condition assessments came along, which are driven by national targets and nature conservation interests. She argued that there is more to moorland assessment than this. Penny presented an outline of how she assesses a moor - how to interpret what you see in terms of its burning and grazing and pollution history, how to identify what else has happened to it such as summer wildfires, and, most importantly of all, how to decide on what should be done, its feasibility and practical problems. This was in the context of the very extensive moorland restoration work being undertaken in the Peak District under the Moors for the Future Project, which is building on 18 years of the Moorland Management Project in which Penny was very active, and the Sustainable Catchment Management Programme (SCaMP) being implemented by United Utilities and monitored by Penny's consultancy.

Geodiversity workshop

The section also organized an afternoon workshop 'Geodiversity: raising its awareness and importance for nature conservation' on Wednesday 17 January 2007 at Liverpool Hope University. This event proved very popular and we had to close bookings with the maximum possible 40 delegates. Please accept our apologies to those who did not secure a place at this workshop. We hope to organize a follow up event soon.

Speakers at this workshop were all of national standing and at the leading edge of this emerging subject. They were Prof. Cynthia V. Burek, (University of Chester, first Professor of Geoconservation in Europe and former chair of UKRIGS) Dr. Jonathan Larwood, (senior geologist and palaeontologist for English Nature and Natural England, and who has been central to the development of Local Geodiversity Action Plans) and Dr Murray Gray, (Queen Mary, University of London, the author of 'Geodiversity: valuing and conserving abiotic nature' published by John Wiley in 2004, and a report for Natural England on 'Conserving geodiversity in the wider landscape').

Coming events

The next events for the section are 'Habitat Management at a Flash!' on Wednesday 14 March 2007 at the Wigan Flashes, led by The Wildlife Trust for Lancashire, Manchester and North Merseyside; 'Carlisle City Flood Alleviation Scheme: Integrated Flood Risk Management' on Thursday, 26 April 2007, led by the Environment Agency. To book a place at these events, or to suggest events in the new programme from May 2007 onwards, please e-mail rooneyp@hope.ac.uk

Paul Rooney CEnv MIEEM
North West England Section Convenor

Soc Env
Society for the Environment

The Society has welcomed two new members - the Royal Institution of Chartered Surveyors (RICS) and the Chartered Institute of Building (CIOB). The Landscape Institute and the Arboricultural Association have also been approved as recommendations to go to the next Board meeting.

For IEEM and the other founder Constituent Bodies the termination of the grandparenting period has meant that new individual applications have significantly slowed. Seven post-Grandparenting applications from IEEM members have been approved since September 2005 and a further 14 applications are in train. There are currently 749 registered Chartered Environmentalists (CEnv) who are IEEM members, still in third position behind CIWEM and CIWM with 802 and 803 respectively. However, there are currently about 80 IEEM members who have not renewed their CEnv subscription.

Currently, IEEM pays £500 as an annual fee and individual members pay £25 to retain their Chartered Environmentalist status. No changes are recommended for 2007 but modest rises are being considered for 2008. IEEM currently charges £200 plus VAT to examine candidates but this also includes the initial joining fee of £50.

The Society is currently serviced by a team of three individuals based at Atherstone and headed by the Executive Director, Dr David Hickie. Having now achieved a significant growth, it is time for a degree of reflection and Board members will be attending an away day in April to identify how the Society might move forward and any modifications to its governance.

In terms of IEEM involvement, the Board members are now Eirene Williams and Jim Thompson. Alex Tait is on the Registration Authority and Jim Thompson is also on the Management Committee. The input from IEEM therefore remains significant.

SocEnv has agreed to put together a joint paper on the Environmental Liability Directive consultation from Defra. This was always seen as one of the main objectives of SocEnv – Professional Institutions speaking with one or at least a co-ordinated voice, but there is still much experience to be gained before SocEnv can be said to be performing effectively in this respect.

EFAEP
European Federation of Associations of Environmental Professionals

Informal General Assembly, Brussels – 8 December 2006

On 8 December 2006 the EFAEP Informal General Assembly was held at Steenokkerzeel, Kasteel van Ham, Belgium.

Jim Thompson gave a presentation on the options for changing the Statutes, which had been on the EFAEP agenda for some time.

EFAEP President, Jan-Karel Mak, welcomed Chartered Institution of Water and Environmental Management (CIWEM) and Institution of Environmental Sciences (IES) as new members, both of which are based in the UK.

There was a report by Matthias Friebel on the progress of the Environmental Management Systems (EMS) Expert Group, which has continued its pan-European exchange of knowledge and experience.

Jason Reeves gave an update on the European Network of Environmental Professionals (ENEP) database, which is in its marketing stages and has moved to its final internat domain location. Each member organisation has agreed to get 100 members to add their details to the database by the end of March 2007.

Tim Christophersen, the Regional Programme Co-ordinator for IUCN, gave a short presentation on the Countdown 2010 declaration that EFAEP had recently signed up to.

There was also a report on the Secretariats meeting in October 2006 by Vera Kessler.

Lastly, there was an update on the action plan and work programme by Linda van Duivenbode, and the brainstorming session summary for the work programme 2007/8 can be seen below.

General Assembly, Prague – 1 June 2007

The next General Assembly will be held in Prague, Czech Republic on Friday, 1 June 2007. There will also be a seminar hosted by EFAEP on Thursday, 31 May 2007, but a topic for the event has not yet been decided.

IUCN
The World Conservation Union

IUCN–UK Committee Meeting and AGM

The IUCN–UK Committee held its AGM and seminar on 18 January 2007. Dr Andy Brown was re-elected as Chair.

The theme of the seminar was Valuing Our Biodiversity.

There were five major presentations and Jim Thompson gave a short presentation on the implementation of the Environmental Liability Directive, which he had asked to be brought to the attention of members of the Committee in view of the approaching deadline for the consultation.

The overall theme of the day was well chosen – ecologists have to operate in the real world of economics and political and conflicting objectives and so have to be able to talk the same language as those who might not share the same views – the language of the bottom line! At the micro level you might ask how can you justify £50,000 per GCN?

The meeting was not about micro levels however – this was the big picture and very interesting it was. In the UK, the government is estimated to spend £325 million and the NGO's a further £149 million on biodiversity (2004/2005). Perhaps the main message I took away from the meeting was the complexity of the issues involved and how it is certainly possible to build up models on which costs might be based – going from that to hard facts and figures is still not easy. Powerpoints for the presentations are available on the IUCN website - www.iucn-uk.org

Paul Morling (RSPB): Who pays for biodiversity? (Estimating the UK's actual and required spend to achieve the 2010 biodiversity targets - preliminary findings)
Sarah Moon (DEFRA): Valuing England's ecosystems
Tony Weighell (JNCC): Ecosystem accounting - what comes out, what goes in. JNCC's global biodiversity impacts programme
Emily McKenzie (JNCC): Economic Tools for the Overseas Territories and other Small Islands
Mike Pienkowski (UKOTCF): Raising awareness of the value of biodiversity in the UK Overseas Territories and costing conservation needs
Jim Thompson (IEEM): Implementation of the Environmental Liability Directive

In the Journals

Jim Thompson CEnv MIEEM and Jason Reeves AIEEM

In addition to the British Ecological Society journals, IEEM will now also be reviewing the journal *Biological Conservation*.

F. Sergio, I. Newton, L. Marchesi and P. Pedrini.

Ecologically justified charisma: preservation of top predators delivers biodiversity conservation.

Journal of Applied Ecology 2006, **43**: 1049–1055.

Because of their popular appeal, top vertebrate predators have frequently been used as flagship or umbrella species to acquire financial support, raise environmental awareness and plan systems of protected areas. However, some have claimed that this approach may divert a disproportionate amount of funding to a few glamorous species without delivering broader biodiversity benefits.

The authors compared the biodiversity values recorded at the breeding sites of six raptor species with those observed at three types of control locations, (i) sites randomly chosen in comparable habitat, (ii) breeding sites of a randomly selected bird species of lower trophic level and (iii) breeding sites of a lower trophic level species with specialized ecological requirements. Biodiversity was measured as the richness and evenness of bird, butterfly and tree species.

Biodiversity levels were consistently higher at sites occupied by top predators than at any of the three types of control sites. Sites occupied by top predators also held greater densities of individual birds and butterflies than control sites.

In a reserve-selection simulation exercise, networks of protected sites constructed on the basis of top predators were more efficient than networks based on lower trophic level species, enabling higher biodiversity coverage to be achieved with a smaller number of reserves.

The results provide evidence of a link between the strategic utilization of top predatory species and ecosystem-level conservation. They suggest that, at least in some biological systems, conservation plans based on apex predators could be implemented to deliver broader biodiversity benefits.

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M. Rundlöf and H.G. Smith.

The effect of organic farming on butterfly diversity depends on landscape context.

Journal of Applied Ecology 2006, **43**:1121–1127.

This is an interesting paper which strengthens the case for organic farming. The recent dramatic decline in farmland biodiversity is often attributed to agricultural intensification and structural changes in the agricultural landscape. Organic farming is thought to benefit biodiversity and to reverse declines and is currently subsidized by European agri-environment schemes. However, the efficiency of agri-environment schemes to preserve biodiversity has recently been questioned, partly because their uptake has been highest in extensively farmed more heterogeneous landscapes.

The authors investigated the effect of farming practice on butterfly species richness and abundance along cereal field headlands and margins on 12 matched pairs of organic and conventional farms in contrasting landscapes (homogeneous and heterogeneous landscape diversity).

Both organic farming and landscape heterogeneity significantly increased butterfly species richness and abundance. But organic farming only achieved this in homogeneous rather than heterogeneous landscapes.

Currently, the majority of organic arable land in Sweden is located in heterogeneous landscapes where changing the type of farming practice adds little to the existing biodiversity. Increasing organic farming in areas of higher landscape homogeneity or more intensive farming is likely to be more effective in increasing biodiversity.

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Small tortoiseshell
Photo: Reg Locock

A.E. Eycott, A.R. Watkinson and P.M. Dolman.

Ecological patterns of plant diversity in a plantation forest managed by clearfelling.

Journal of Applied Ecology 2006, **43**:1160–1171.

Commercial forests represent an important but often neglected biological resource. This study related the understorey plant species composition of a coniferous plantation forest managed by clearfelling to environmental factors (stand structure, soil pH and previous land use) and ecological patterns (abundance-occupancy relationships, species dispersal and life history).

Plant species richness and composition were recorded in 326 managed stands of different ages, soil types and land-use histories in a 185 km^2 lowland forest planted onto heath and arable land.

Stands replanted in the last 10 years had the greatest species richness, typically containing about 18 plant species. Stands on soils of high pH had greater plant species richness, as did those on previously arable land.

Rotational clearfelling of plantations may be an appropriate form of forest and conservation management in forests planted on former open areas such as heaths, where the conservation interest is not in old-growth species but in earlier successional species. Maximizing young growth stages will help maximize plant diversity in such cases. The authors note that these prescriptions contradict guidance for sustainable forestry but argue that it is appropriate to vary guidelines according to land-use history and species composition.

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K.E. Hayter and J.E. Cresswell.

The influence of pollinator abundance on the dynamics and efficiency of pollination in agricultural *Brassica napus*: implications for landscape-scale gene dispersal.

Journal of Applied Ecology 2006, **43**: 1203–1212.

It is important to understand the pollination processes that generate landscape-scale gene dispersal in plants, particularly in crop plants with genetically modified (GM) varieties. In *Brassica napus*, the situation is complicated by uncertainty over the relative importance of two pollen vectors, wind and insects.

The authors investigated pollination in two fields of *B. napus* that bloomed at different times of year (April vs. July) and attracted different abundances of foraging social bees.

Flowers open in April were adequately pollinated only after five days and only 10% received even a single bee visit. Flowers open in July received three bee visits per hour and were fully pollinated within three hours.

Based on published measurements of airborne pollen dispersal, they estimate that wind-pollination from a hypothetical field 1 km distant could have fertilized up to 0.3% of the field's seed when bees were scarce in April but only up to 0.007% when bees were abundant in July.

The results suggest that the susceptibility of fields of *B. napus* to long-distance cross-pollination by wind depends on the level of bee activity.

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A.N. Cureton, H.J. Newbury, A.F. Raybould and B.V. Ford-Lloyd.

Genetic structure and gene flow in wild beet populations: the potential influence of habitat on transgene spread and risk assessment.

Journal of Applied Ecology 2006, **43**: 1203–1212.

The authors examined five UK sea beet *Beta vulgaris ssp. maritima* populations from each of two major habitat types, cliff top and drift line and assessed the likelihood and consequences of spread to wild populations of genes from cultivated sugar beet group *Beta vulgaris ssp. vulgaris*, which could in the future be transgenic. Sugar beets are harvested in the vegetative phase but seed or pollen transfer could occur from unharvested plants in field margins or elsewhere.

Drift line populations may receive seed carried by the sea whereas cliff top populations would not but would be more likely to receive pollen. Drift line populations were more diverse than cliff top populations and also showed greater levels of gene flow.

Isolation by distance was evident in both habitats, but the relationship between genetic and geographical distance was detectable over longer distances for drift line populations.

The likelihood of transgene spread from crop to wild populations is habitat dependent and conservation management decisions could therefore vary from one population to another, for example water courses were found to facilitate seed dispersal. This should be taken into account when estimating isolation distances for GM beet, and when predicting transgene frequencies (exposure estimates) for environmental risk assessments of GM beet.

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Sugar beet
Photo: Jim Thompson

J. Wretenberg, Å. Lindström, S. Svensson, T. Thierfelder and T. Pärt.

Population trends of farmland birds in Sweden and England: similar trends but different patterns of agricultural intensification.

Journal of Applied Ecology 2006, **43**: 1110–1120.

Studies, mainly from the UK, show that many farmland birds have declined as a result of recent agricultural intensification. The authors tested this idea by analysing farmland bird population trends in Sweden, a country with less dramatic agricultural changes and less intensive agriculture. They investigated whether (i) farmland specialists have declined more than generalists, (ii) population declines in Sweden are less marked than in England and (iii) Swedish population trends are associated with changes in the amount of autumn-sown crops, and inputs of pesticides and fertilizers.

Farmland bird populations have declined at least as much in Sweden as in England. Several specialist species displayed similar temporal patterns in population change in both countries.

The similarities in bird population trends in Sweden and England, despite large differences in patterns of agricultural change in Sweden and England, may be explained by: (i) common wintering grounds, (ii) similar negative effects of agricultural intensification (England) and intensification/abandonment (Sweden) and (iii) a simultaneous loss of landscape heterogeneity.

The authors suggest that the marked declines in Swedish populations are caused by (i) the dual negative effects of intensification and abandonment of farmland at breeding grounds, and (ii) Swedish populations partly sharing wintering grounds with English populations. They conclude that agri-environmental schemes need to be flexible enough to address the negative effects both of intensification and the abandonment of farming.

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M. Rederiksen, M. Edwards, A.J. Richardson, N.C. Halliday and S. Wanless.

From plankton to top predators: bottom-up control of a marine food web across four trophic levels.

Journal of Animal Ecology 2006, **75**: 1259–1268.

In the North Sea, the lesser sandeel is the main prey of many bird, mammal and fish predators and the target of a major industrial fishery. However, since 2003, sandeel landings have decreased by > 50%, and many sandeel-dependent seabirds

experienced breeding failures in 2004.

Current understanding of the regulation of key constituents of this ecosystem is poor. Sandeel abundance may be regulated 'bottom-up' by food abundance, often thought to be under climatic control, or 'top-down' by natural or fishery predation. The authors tested predictions from these two hypotheses by combining long-term data sets (1973–2003) on seabird breeding productivity from the Isle of May, SE Scotland, and plankton and fish larvae from the Continuous Plankton Recorder survey. They also tested whether seabird breeding productivity was more tightly linked to sandeel biomass or quality (size) of individual fish.

The biomass of larval sandeels increased two- to threefold over the study period and was positively associated with abundance of their plankton prey. Breeding productivity of four seabirds bringing multiple prey items to their offspring was positively related to sandeel larval biomass but in one species bringing individual fish it was strongly associated with the size of adult sandeels.

These links are consistent with bottom-up ecosystem regulation and, with evidence from previous studies, indicate how climate-driven changes in plankton communities can affect top predators and potentially human fisheries through the dynamics of key mid-trophic fish. However, the failing recruitment to adult sandeel stocks and the exceptionally low seabird breeding productivity in 2004 were not associated with low sandeel larval biomass in 2003, so other mechanisms (*e.g.* predation, lack of suitable food after metamorphosis) must have been important in this case. Understanding ecosystem regulation is extremely important for predicting the fate of keystone species, such as sandeels, and their predators.

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L.C. Maskell, L.G. Firbank, K. Thompson, J.M. Bullock and S.M. Smart.

Interactions between non-native plant species and the floristic composition of common habitats.

Journal of Ecology 2006, **94**: 1052–1060.

The authors investigated the role of non-native species in common British plant communities using botanical data from two stratified random surveys carried out in 1990 and 1998.

They found that from 16,851 plots surveyed in 1998 there were 123 non-native species found mostly in arable, tall grass/herb and fertile grassland habitats. Invasive non-native species, *e.g. Fallopia japonica*, *Impatiens glandulifera* and *Rhododendron ponticum*, were uncommon.

In the British countryside non-native species were mainly found in habitats with anthropogenic associations, high fertility, high number of ruderal species and high diversity.

National-scale changes in plant community composition are likely to be closely correlated with external land-use impacts. Changes such as eutrophication, nitrogen deposition and increased fertility in infertile habitats are likely to benefit both native and non-native invasive species; however, currently these trends benefit native species much more often than non-natives.

Non-native species are known to have significant effects on native species at local scales in many countries; however, at the landscape scale in Great Britain they are best considered as symptoms of disturbance and land-use change rather than a direct threat to biodiversity.

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L. Mommer, J.P.M. Lenssen, H. Huber, E.J.W. Visser and H. de Kroon.

Ecophysiological determinants of plant performance under flooding: a comparative study of seven plant families.

Journal of Ecology 2006, **94**: 1117–1129.

Plant performance of species in river floodplains is negatively affected by submergence, due to severely hampered gas exchange under water. Several individual traits have been shown to determine flooding tolerance, but the interrelationships among these traits and their effects on plant performance still remain largely unknown.

The idea was to aim for a more coherent understanding of submergence tolerance, by investigating whether different traits are alternative strategies to enhance survival under water or whether these traits act in concert.

Species originating from frequently flooded habitats were taller and had a higher specific leaf area (SLA), chlorophyll content, aerenchyma content, and longer longevity of terrestrial and 'aquatic' leaves compared with species from dry habitats. The frequently flooded species appeared to be more plastic for these traits in response to submergence.

These traits were divided in two independent clusters structured either around the petiole (*i.e.* aerenchyma content and shoot length) or the leaf lamina (*i.e.* SLA, chlorophyll content and leaf longevity). Shoot length and aerenchyma content of the petiole were also positively correlated, albeit not significantly. A positive correlation between SLA and leaf longevity was observed under water, indicating that thinner leaves may have an increased potential for gas exchange, resulting in increased leaf longevity and plant survival.

The study shows that multiple ecophysiological traits act in concert to fine tune responses to dynamic and unpredictable environments such as river floodplains.

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A. Bischoff, L. Crémieux, M. Smilauerova, C.S. Lawson, S.R. Mortimer, J. Dolezal, V. Lanta, A.R. Edwards, A.J. Brook, M. Macel, J. Leps, T. Steinger and H. Müller-Schärer.

Detecting local adaptation in widespread grassland species – the importance of scale and local plant community.

Journal of Ecology 2006, **94**: 1130–1142.

This paper is a challenge to the view held by many conservationists that local is necessarily best in terms of sourcing material for restoration and habitat creation. The experimental work was based on sowing seeds of *Holcus lanatus*, *Lotus corniculatus* and *Plantago lanceolata* from a Swiss, Czech and UK in a reciprocal transplant experiment in fields that exhibit environmental conditions similar to the source sites.

The paper concludes that the view that local genotypes should be preferred in habitat creation or restoration has to be modified. Populations that are further away from similar habitats may be better adapted than neighbouring populations from contrasting habitats. Environmental distances are therefore more appropriate for selecting suitable provenances than only geographical distances.

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R.H. Marrs and the late A.S. Watt.

Biological Flora of the British Isles: *Pteridium aquilinum* (L.) Kuhn.

Journal of Ecology 2006, **94**: 1272–1321.

This account with an IEEM Fellow as the senior author, reviews information on all aspects of the biology of bracken *Pteridium* (mainly *aquilinum ssp. aquilinum*) that are relevant to understanding its ecological characteristics and behaviour. At about 50 pages long, this is probably the most comprehensive article of any in this long running series. The main topics are presented within the standard framework of the Biological Flora of the British Isles: distribution, habitat, communities, responses to biotic factors, responses to environment, structure and physiology, phenology, reproductive characters, herbivores and disease, history, and conservation. For those unfamiliar with the many papers on bracken produced by these authors – and this is something of a tribute to the late A.S. Watt, this is an erudite distillation of current knowledge. It should come with a health warning – do not work on bracken until you have read this paper!

Pteridium is a complex genus comprising a number of species, subspecies and varieties. It is thought to be a woodland genus, but it can grow in the open. It is cosmopolitan and occurs on all continents except Antarctica. It responds to human disturbance and is often found in open spaces after forest clearance and cultivation. In some situations it can be a troublesome weed, causing problems for land managers. Its abundance and distribution in Britain are predicted to increase as a result of global climate change.

Pteridium aquilinum ssp.aquilinum, the most common taxon in the British Isles, occurs in many plant communities, and it is apparently limited by frost and waterlogging. Its abundance has probably increased in the relatively recent past as a result of changing land management, and this increase impinges on plant communities with a high conservation interest. The changed land management reflects changing use of agricultural land and also a reduction in the use of *Pteridium* as a resource. Accordingly, in many places *Pteridium* is viewed as a weed and management is needed to control it and restore more desirable vegetation. These management techniques are summarized.

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H. Jacquemyn, R. Brys, M. Hermy and J.H. Willems.

Long-term dynamics and population viability in one of the last populations of the endangered *Spiranthes spiralis* (Orchidaceae) in the Netherlands.

Biological Conservation 2007, **134**: 14-21.

During the last decades, most orchid species in much of Western Europe have suffered significant declines and the long-term survival of the remaining populations remains to a large extent uncertain. In particular, populations at range margins may be more prone to extinction than more central populations, as the former tend to be small and isolated, occur in ecologically marginal habitats and have a lower per-capita reproductive rate. In the study, the authors investigated the long-term dynamics and population viability of a population at the margin of its range of Autumn Lady's Eresses *Spiranthes spiralis* in the Netherlands. At present, only two out of 40 previously known populations persist. Individual plants were monitored for 24 years and their life span, flowering frequency and vegetative growth were determined. Individual plants showed large temporal variation in sexual and vegetative growth among years. The proportion of flowering plants varied from zero (no plants were flowering) to 100 (all plants were flowering). Vegetative growth, on the other hand, increased when the number of individuals decreased. Dormancy was present, but occurred only in a few individuals. Using a non-structured population viability model, future prospects of this species were assessed. Calculation of extinction probabilities and estimated times to extinction using the diffusion approximation model showed that the species had a relatively high probability (79%) of surviving the next 20 years, whereas the median time to extinction was forty years. The authors suggest that continued monitoring and additional genetic research are needed to assess the long-term viability of this species.

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A.M.A. Franco, J.M. Palmeirim and W.J. Sutherland.

A method for comparing effectiveness of research techniques in conservation and applied ecology.

Biological Conservation 2007, **134**: 96-105.

In conservation science or applied ecology there is often a range of techniques available to study a given problem. It is clearly sensible to use the most effective, but the cost-effectiveness of different methods is rarely compared. Comparisons are not straightforward, as the selection of the best method will depend on the time, budget and equipment, and human resources available. The most efficient method in one case might not be that for another with different constraints. To overcome this problem the authors used a sub-sampling approach to make such comparisons among research techniques, comparing the results achievable with increasingly larger subsets of data, and using a cost-efficiency analysis. They illustrated this approach with a comparison of two common techniques, radio-telemetry and transects surveys, in the study of habitat selection by the lesser kestrels *Falco naumanni*, not to be confused with the kestrel *Falco tinnunculus* found in Britain. Habitat preferences were determined using compositional analysis with the two methods providing similar overall results. Telemetry resulted in a larger number of significant differences between the habitats, but the costs were higher; 312 EUR per statistically significant difference compared to 82.5 EUR for transect data. Transects were a cheaper technique but when surveying a large area they are limited by road availability. The authors suggest that the comparison of the effectiveness of techniques should be routinely applied to a range of conservation issues.

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J. Zamora, J.R. Verdú and E. Galante.

Species richness in Mediterranean agroecosystems: spatial and temporal analysis for biodiversity conservation.

Biological Conservation 2007, **134**: 113-121.

The authors used dung beetles as an indicator group to identify the most important habitats for biodiversity conservation in a Mediterranean traditional agroecosystem. The relationships between traditional grazing and farming activities and biodiversity were analysed by comparing species richness and temporal turnover across three different habitat types, defined according to vegetation structure and human land use. In this study, both spatial (landscape, among-habitats) and temporal (intra-annual, seasonal) analyses were contemplated at mesoscale.

The results showed open mosaic areas as the richest and most temporally heterogeneous habitats. The authors suggest the maintenance of traditional human activities carried out in these areas, since they have been a significant diversification agent, to avoid the loss of the high Mediterranean biological diversity.

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Meditterean terraces in disrepair
Photo: Jim Thompson

T. Kenta, N. Inari, T. Nagamitsu, K. Goka and T. Hiura.

Commercialized European bumblebee can cause pollination disturbance: an experiment on seven native plant species in Japan.

Biological Conservation 2007, **134**: 298-309.

Non-native pollinator species are now widely utilized to facilitate pollination of agricultural crops. Evaluation of the ecological risk of alien pollinators is necessary because they could have a large impact on native ecosystems through disturbing native plant–pollinator interactions. The authors conducted a greenhouse experiment to examine the impact of the non-native commercialized European bumblebees, *Bombus terrestris*, on the pollination success of seven Japanese bumblebee-pollinated plant species. Plants were exposed to three groups of bumblebees: native bumblebee(s) only (NATIVE treatment); the alien bee only (ALIEN) and a mix of the two (MIX). ALIEN treatment had negative effects on fruitset and/or fruit quality of five plants. The negative effects were caused by a decrease in legitimate flower visitation due to (1) physical inaccessibility to nectary in deep-corolla flowers by the alien bee with insufficient tongue length and, (2) biased flower preference between short-corolla flowers. Fruitset tended to decrease drastically for the self-incompatible species while fruit quality decreased moderately for the self-compatible species. Effects of MIX were not intermediate between NATIVE and ALIEN in most plant species, and caused pollination success to vary in an unpredictable manner amongst plant species, probably due to interaction between native and alien bees. This relationship between plants' pollination success and the relative density of the alien suggests that the alien bee can disturb pollination of a plant species even when only representing a small fraction of the total pollinator community.

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M. Niemeyer, T. Niemeyer, S. Fottner, W. Härdtle and A. Mohamed.

Impact of sod-cutting and choppering on nutrient budgets of dry heathlands.

Biological Conservation 2007, **134**: 344-353.

Heathlands are endangered by both atmospheric nutrient deposition and natural succession. High-intensity management measures are considered necessary, as low-intensity measures (*e.g.* mowing, prescribed burning) are not able to compensate for atmospheric nutrient loads. Choppering (*i.e.* the near-complete removal of the organic layer) has several advantages over sod-cutting, including less waste material, faster vegetation recovery and lower costs. This raises the question as to the extent to which choppering and sod-cutting affect nutrient budgets in dry heathlands.

The authors compared the quantities of N, Ca, K, Mg, and P removed by choppering and sod-cutting in the Lueneburg Heath (NW Germany). Nutrient balances were calculated by analysing atmospheric inputs, elevated leaching rates following management, and output due to the removal of above-ground biomass and humus horizons.

Nutrient loss was particularly high after removal of the organic layer and the uppermost zone of soil. In contrast, increased leaching after management was of minor importance for nutrient budgets. Although considerably more nutrients were removed by sod-cutting than by choppering (*e.g.* N: 1712/1008 kg ha^{-1}), nutrient output by choppering was still sufficient to compensate for 60.7 years of net N-input. Choppering was able to remove more N per volume unit than sod-cutting due to higher N-contents in the organic layer than in the uppermost zone of soil. For this reason, choppering is more economical than sod-cutting and, thus, should be considered the preferable method at sites not dominated by *Molinia caerulea*. A combination of high-intensity measures with prescribed burning would appear to be suitable as this would ensure more selective removal of N.

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A.R. Edwards, S.R. Mortimer, C.S. Lawson, D.B. Westbury, S.J. Harris, B.A. Woodcock and V.K. Brown.

Hay strewing, brush harvesting of seed and soil disturbance as tools for the enhancement of botanical diversity in grasslands.

Biological Conservation 2007, **134**: 372-382.

Since the middle of the last century agricultural intensification within Europe has led to a drastic decline in the extent of botanically diverse grasslands. Whilst measures to enhance the diversity of agriculturally-improved grasslands are in place, success has often been limited. One of the primary factors limiting success is the paucity of sources of propagules of desirable species in the surrounding landscape. The restoration of two contrasting grassland types (lowland hay meadow and chalk grassland) was examined using a replicated block experiment to assess the effectiveness of two methods of seed application (hay strewing and brush harvesting) and two methods of pre-treatment disturbance (power harrowing and turf stripping). The resulting changes in botanical composition were monitored for four years. Seed addition by both methods resulted in significant temporal trends in plant species composition and increases in plant species richness, which were further enhanced by disturbance. Power harrowing increased the effectiveness of the seed addition treatments at the lowland hay meadow site. At the chalk grassland site a more severe disturbance created by turf stripping was shown to be preferable. Whilst both hay strewing and brush harvesting increased plant species richness, hay strewing was more effective at creating a sward similar to that of the donor site. Soil disturbance and seed application rate at the recipient site and timing of the hay cut at the donor site are all factors to be considered prior to the commencement of restoration management.

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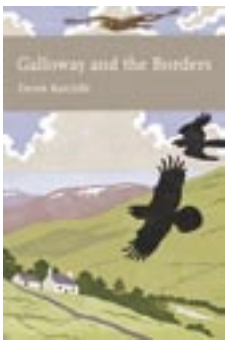
Recent Publications

Ireland's Coastline

Author: Richard Nairn CEnv MIEEM
ISBN-10: 1903464501
Available from: www.collinspress.com
Price: £14.99

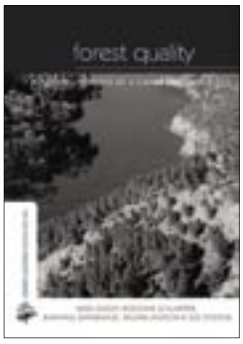
No part of Ireland is more than 100 km from the coast and over half the population live within 10 km of it. Yet it has over 7,500 km of coastline. Ireland is inextricably linked to the sea. This book is a comprehensive account of the natural and human history of the Irish coastline. In the book the natural habitats are explored by looking at the shape and structure of the coast from the shore to the open sea, along with a look at how the coast of Ireland has been shaped through history. The plants and animals that live in the various habitats, from rocky shores to the open sea, are also considered in the author's wide-ranging commentary. The human aspect of the coast is investigated by looking at how people, past and present, live on the coast, how they survive there and respect and enjoy it. Also covered is coastal archaeology, early whaling, hunting of seabirds, traditional boats and life on the islands. There is also information on tourism and leisure attractions and the text is illustrated with fantastic aerial and underwater photography and includes colour maps.



New Naturalist Galloway and the Borders

Author: Derek Ratcliffe
ISBN-13: 9780007174027
Available from: www.collins.co.uk
Price: £45 hardback/£25 paperback

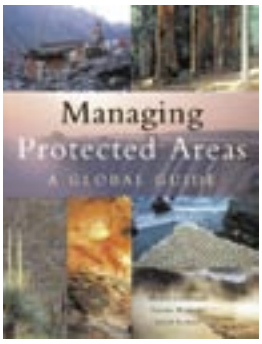
This book explores environmental change over half a century in a surprisingly diverse part of Scotland. Galloway and the Borders is often overlooked as the plainer and less charismatic sibling of the Highlands and West Coast, but it nonetheless has a rich diversity of wildlife and encompasses all the main habitats to be found in Britain. From rolling moors with hidden glens and native and introduced woodlands to expansive mudflats, wetlands, fens and salt marshes to shingle beaches, rugged sea cliffs and seabird stations; there is little monotony in this equally wild but more gentle landscape. The thousands of barnacle geese that overwinter on the Solway Forth are the region's biggest wildlife spectacle – found a stone's throw from the most northerly populations of natterjack toads, and inland, keen-eyed visitors may get views of a small but recovering populations of golden eagles and peregrine falcons. The area has also seen one of the most extensive programmes of re-forestation in Britain and contains many Sites of Special Scientific Interest and nature reserves. The author also explores in detail the results of conservation efforts in the region and the contribution that naturalists can make to the ongoing conservation of the area.



Forest Quality

Authors: Nigel Dudley, Rodolphe Schlaepfer, Jean-Paul Jeanrenaud, William Jackson, and Sue Stolton
ISBN-10: 1844072789
Available from: www.earthscan.co.uk
Price: £39.95

This is the first ever guide to 'forest quality' assessment and addresses the 'authenticity' of forests and criteria for determining the environmental, economic and social value of different types of forest. It is a practical, hands-on manual for professionals involved in forestry, conservation and resource management worldwide and has case study material from Europe, Asia, Africa and Latin America showing the practical uses of the new 'landscape' approach to forest conservation. In this groundbreaking text, forest quality is discussed as a useful new concept in forest conservation and management. Three main assessment criteria are used: authenticity; environmental benefits; and social and economic benefits. A methodology and protocol for collecting and analysing data is described, and the approach needed with each indicator is outlined in detail. A landscape approach to assessment is advocated, as meeting conservation goals also means addressing human needs, and balancing the trade-offs involved is only possible at a landscape scale.



Managing Protected Areas – A Global Guide

Editors: Michael Lockwood, Graeme Worboys, and Ashish Kothari
ISBN-10: 1844073033
Available from: www.earthscan.co.uk
Price: £44.96

There are over 108,000 protected areas on earth covering 13.5 million square kilometres – an area the size of China and India combined. This book, produced by a multitude of experts for IUCN, claims to be the most authoritative guide ever compiled on the principles and practice of protected areas management. The book covers the full range of protected areas management and includes dozens of detailed international cases studies, hundreds of concise topical snapshots, maps, tables, illustrations and a colour plate section, as well as evaluation tools, checklists and numerous appendices to cover all aspects of park management from biodiversity to natural heritage to financial management. The book also establishes a conceptual underpinning for protected area management, presents guiding principles for the 21st century, reflects recent work on international best practice and provides an assessment of skills required by professionals. The publication is relevant to the full range of management systems worldwide, balancing more traditional, developed country approaches with developing country systems including participatory, integrated, multi-sectoral and value-driven approaches.

News in Brief

Wolves to save the Highlands?

A recent Royal Society study has stated that the reintroduction of the predator could solve the deer population problem. The wolf could, the study reports, help to rejuvenate the Highlands, recreating a chain of rich native forests over its hills and glens.

Wild birds killed at poisoned park lake

A suspected new outbreak of botulism has killed more than 200 wildfowl in Victoria Park's west lake in east London, six months after dozens of ducks and cormorants died.

Zoo to act as matchmaker for rare ant

Britain's rarest species of ant, the red-barbed ant (*Formica rufibarbis*), is under threat from loss of its habitat and raids by a fellow species. Only one colony, all female, remains on mainland Britain, in Surrey. The sole surviving male nest, two miles away, died out last year. The main threat is habitat, grazed heathland, destruction by ploughing and building development. Raids by the slavemaker ant (*Formica sanguinea*) have also reduced numbers. The Zoological Society of London has been offered £50,000 from the Heritage Lottery Fund to save the ant. Scientists will introduce males from the Isles of Scilly to the Surrey females at London Zoo. If they breed, the new colonies will be released to prepared sites in Surrey.

Marine research centre planned

A multi-million pound marine science research centre is being planned for Devon. The centre is planned by the Plymouth Marine Sciences Partnership, which is made up of marine and ocean science groups and the University of Plymouth. The group said it could consolidate Plymouth as an international centre for marine science research and expertise. If proposals for the state-of-the-art research, education and conference centre go ahead, it could open in 2010.

Trust's eco-friendly island plans

Alderney Wildlife Trust has said it has ambitious plans to make the island more eco-friendly. The plans include establishing a scientific advisory panel and environmental records centre. It is also proposing a management plan which would ensure Alderney's environmental resources were cared for in a sustainable way.

Alien species invade space for development

The invasion of alien plant species could have a serious impact upon regeneration and deprive areas of much needed investment, Dr Ian Rotherham of Sheffield Hallam University, told the Barriers to Development Conference in London earlier this year. He said that a lack of co-ordination and expertise by local authorities and regional agencies could end up costing communities. Invasive plants cause such devastation that areas in desperate need of development may be abandoned as developers attempt to avoid the problems.

National Deer-Vehicle Collisions project

The Deer Collisions project has updated its website (www.deercollisions.co.uk) with new information including up-dated national and regional distribution maps for 2003-05. In 2008, the project will focus on data sources for trunk road agents, animal rescue organisations, insurance companies, police records for DVCs causing human injury, as well as incidents attended by rangers in a range of major forests.

Could climate change mean more starving porpoises?

As the seas around the UK warm due to global climate change, new evidence from the University of Aberdeen suggests that increasing numbers of Europe's smallest cetacean, the harbour porpoise, are starving to death in the North Sea around Scotland. While the porpoises themselves don't mind warmer waters, their preferred prey, the sandeel, doesn't and is becoming less abundant as a result. It makes it clear that to save the whales, you need to save the fish they feed on.

UK marine mapping project

UKSeaMap, the first full survey of the UK's marine features has been published by the Joint Nature Conservation Committee, and is a significant step forward to the greater protection of marine wildlife. The two-year UKSeaMap project, which was part funded by the RSPB, identifies features on the seabed and within the water column, providing a broad pattern of the UK's marine habitats. The UKSeaMap project, which is led by the Joint Nature Conservation Committee, is a partnership of ten organisations including Government departments, agencies, advisers and conservation charities. Visit the project website at www.jncc.gov.uk/page-2117.

Environmental conditions placed on south Wales pipeline

Stringent environmental conditions have been placed on National Grid for the construction of the second phase of the pipeline connecting new gas import terminals at Milford Haven to the national transmission system. The 196 km pipeline will run from Felindre near Swansea to Tirley in Gloucestershire and is one of a number of critical new gas infrastructure projects helping the UK adjust to being a net importer of gas. Consent has been granted based on rigorous conditions including: appointment of an overseer by the Brecon Beacon National Park Authority to monitor works in the National Park; restoration of soil to agreed methods and timetables; a 10 year aftercare programme to ensure that any sensitive areas are properly restored; and measures to safeguard protected species such as otters and dormice.

Otter population is on the rise

The otter population in Bedfordshire is on the rise because of the improved health of rivers, a study by the Greensand Trust on behalf of Bedfordshire County Council has shown. The presence of otters reflects the overall health of their habitat and the rare animals are often used as indicators of river condition.

Wind farm may 'damage' island bog

An island wind farm would cause 'irreversible damage' to an important wetland site, say the Scottish Wildlife Trust (SWT) which is opposing plans for a 181-turbine development on the Isle of Lewis. The Trust fears the proposed £500 million development by Lewis Wind Power would destroy some of the world's most extensive and intact areas of blanket bog.

Rabbits face gas cull

A mass cull of the prodigiously fertile animal is being planned to protect one of Scotland's rarest and most fragile habitats. The machair is an internationally important system of low-lying sand pastures that run along the Atlantic coast of the Outer Hebrides but an explosion in rabbit numbers caused by a succession of mild winters is now causing serious erosion to the eco-system. Giant burrow networks are loosening the ground, making the dunes more vulnerable to the increasing number of violent storms. Councillors are urging Scottish Natural Heritage (SNH) to consider gassing thousands of

the animals to save the machair from destruction. SNH has recently targeted both mink and hedgehogs on the islands as part of a conservation programme. Animal rights campaigners say non-lethal methods, such as fencing, should be tried first before a cull is ordered.

Nature trust given cash boost

The Hawk and Owl Trust has received £50,000 from an environmental trust. Viridor Credits Somerset has given the money to towards the purchase of 55 ha of arable land on Shapwick Moor, Somerset. The overall aim of the project is to transform the area, which is a Site of Special Scientific Interest, into a haven for wildlife. Viridor Credits Somerset, an environmental trust, is now looking for more causes within a ten-mile radius of the landfill sites at Dimmer, near Castle Cary and Walpole, near Bridgwater, in which to distribute money.

Erosion threatens Welsh beaches

Almost three-quarters of some of the most beautiful and precious stretches of the Welsh coast are threatened by erosion and flooding because of rising sea levels, a study from the National Trust has claimed. Fabulous beaches, dune systems, iron age forts, lagoons and seaside villages could all vanish within a century. The report, Shifting Shores, says 55 sites owned by the Trust, covering more than 100 miles, are in danger because of erosion caused by global warming and climate change. The Trust, the biggest owner of coastline in the UK, has produced the report partly because it believes most people think of erosion as a problem centred on the east and south-east. But it stresses that Wales's more rugged coast is also under threat. The Trust has called for policy makers to take urgent action to develop and implement long-term plans to tackle the problem of predicted rises in sea level. It opposes concrete sea defences, claiming these only shift the problem to a different area and says the experts need to work with nature to find solutions. The Trust is also demanding a simple mechanism for people living in coastal areas to find out whether their homes and businesses may be in jeopardy.

EU Environmental Crime Directive unveiled

Dumping hazardous waste, polluting protected areas and collecting wild flowers would all be punishable by jail and hefty fines under new plans for EU-wide 'green crimes'. Companies could face fines of up to €1.5 million and directors up to 10 years in jail, under proposals for a new Directive on environmental crime. The draft Directive, issued by the European Commission, requires member states to criminalise a wide range of environmental breaches where they have been committed 'intentionally' or with 'serious negligence'.

Fears of increased wild bird crimes

The withdrawal of a scheme requiring bird keepers to register individuals of the most threatened bird species held in captivity could lead to an increase in the number of birds, especially peregrine falcons and goshawks, taken from the wild. The Government's bird-registration scheme, Section 7 of the Wildlife and Countryside Act 1981, has been crucial in preventing wild-caught birds being passed off as those bred in captivity. Despite the scheme's success in protecting wild birds, it is feared the Government may axe the scheme to reduce bureaucracy and save costs.

Britain's lakes poisoned

A study, headed by the Environment Agency, has found that nearly 400 of Britain's most wildlife-rich lakes are being stifled by pollution. They include most of the country's best-known and best-loved expanses of water. The study covered the 1,047 'most ecologically valuable' of Britain's 14,000 lakes, those either protected as Sites of Special Scientific Interest (SSSI), or home to Britain's most endangered species. It found that 379 of them are so 'degraded' that they are in urgent need of 'rehabilitation'. Semerwater, in the Yorkshire Dales, is so badly affected that it is virtually dead. The Environment Agency is now joining with other official bodies to mount a rescue programme of 'lake habitat action plans'.

Disease kills Manchester's park trees

About 1,700 black poplar trees are to be felled across Manchester parks due to fungal disease. The city's black poplars, which are rare in the UK, have become infected with a fungal disease, which will eventually destroy them. The fungal disease, *Venturia*, commonly known as scab, is prevalent among apple and pear trees, although little is known about it in the poplar. Experts have advised that the trees should be removed because they cannot be treated. Manchester City Council is planning a programme of replanting and is urging residents to take cuttings for gardens. Climate change is thought to be a factor in the disease.

Green light for wind farm in Devon

A wind farm planned for west Devon has been given the go ahead after objections were overturned on appeal. Plans to build nine, 120 m (394 ft) high turbines in the Den Brook Valley near North Tawton were rejected last year by West Devon Borough Council, but the plans have now been given the thumbs up by a planning inspector who said that the wind farm would not affect Dartmoor National Park, which is five miles from the site. There is one other wind farm in operation in Devon, which is at Brad worthy in north Devon. Plans are being considered for four more turbines on the Den Brook Valley site and have also been submitted for wind farms at Fallbrook Down near Ilfracombe and at Batsworthy near Rackenford in north Devon. And another application has been submitted for three turbines at Goveton near Kingsbridge in the south of the county.

Tree planting turns streets green

People living in south London are to help plant 30 trees as part of a project to make the streets greener. The charity Trees for Cities is currently working to introduce 50 trees in the area by March 2008. As part of the scheme 24 trees have been planted in Margate Road and Appach Road, Brixton. A further six will also be planted elsewhere in the Brixton.

Blame for global warming placed firmly on humankind

The fourth report of Working Group 1 of the Intergovernmental Panel on Climate Change (IPCC) says with 90% certainty that the burning of fossil fuels and other human activities are driving climate change. The report says the rise in global temperatures could be as high as 6.4°C by 2100. The report also predicts sea level rises and increases in hurricanes. The new IPCC report is the work of 3,750 climate experts, who have spent six years reviewing all the available climate research. It is thought that the amount of global warming needed for the Greenland icecap to become unstable is between 1.9 and 4.6°C over pre-industrial temperatures. Breaching that threshold would make much greater rises in sea level likely in centuries to come. Antarctica is expected to keep gaining weight, although the slipping of large sections of ice into the sea could reverse this. Scientists also say that predicting how clouds will form and affect projected rises in temperatures and sea levels in a warmer world remains uncertain.

Climate change, what's that?

In a recent online survey of over 25,000 people in 46 countries it was found that 13% of Americans had never heard of climate change, despite the fact that the USA produces more greenhouse gas emissions than any other country. Only the United Arab Emirates scored worse at 16%.

Health and Safety Tauro-Scatology

This month, Basil O'Saurus, *In Practice*'s very own Professor of Tauro-Scatology, departs from his usual environmental pre-occupations to tell us about another of his sidelines. What is it this time, Prof?

It is a subject of relevance to *In Practice* readers because it deals with health and safety. Even though the situations described do not involve environmental practice, there should be something here for most readers, particularly the more anally-retentive of the IEEM membership.

Middle management, in other words?

I didn't say that.

Tell us what you are doing, then.

I'm health and safety consultant to a very contemporary production of Macbeth. You've no doubt seen Shakespeare productions that use modern dress and such like but where aspects of the production are still decidedly 17th century in their attitude.

Give us an example.

Well, Macbeth, of course, opens with the three witches on a blasted heath brewing a concoction. That may well have been appropriate in Shakespeare's day but I told the Director that this scene would now need to be set in a laboratory, with a fume hood, and that the witches would need appropriate protective clothing.

And how was this advice received?

Not very well. Especially when I added that Macbeth himself would not count as 'Authorised Personnel' so should not be allowed into the laboratory under any circumstances. But that was nothing compared to her reaction later when I rewrote Act II Scene 1.

What did you do?

Anyone with a 'Duty of Care' over employees and members of the public would spot the problem straight away. Macbeth commits a serious error when he asks 'Is this a dagger that I see before me?' If he suspects that there is a sharp-bladed implement on the premises, the correct action is to report it to his line manager, not to announce his vague suspicion to the audience. I did some mild editing so that Macbeth reports his concerns to the Stage Manager who, in this particular instance, is the de facto line manager. The Stage Manager then puts the house lights up, comes on stage and asks the audience to leave in an orderly manner so that the premises can be searched.

I bet the director loved that suggestion.

A few artistic disagreements, I admit. But all in the cause of ensuring a genuinely 'contemporary' feel. After all, the Scottish royal household that Shakespeare is describing is, in contemporary terms, a public body and Jobsworth health and safety officers are as much a feature of modern public bodies as ….

…. Performance targets? Re-organisations? Pay scales that lag behind their equivalent in the private sector?

I see that you are beginning to understand. We also had some problems later in the play, where Lady Macbeth is trying to clean her hands.

Wait a moment, you've skipped over the murder scene. Surely you can't avoid this?

We side-stepped this. Whilst murder itself is, obviously, out of the question, we felt that a bit of back-stabbing is inevitable within the management of contemporary public bodies. But to get back to Lady Macbeth ….Act V Scene 1, to be precise.

What happens here?

This is the scene where the sleepwalking Lady Macbeth tries to clean her hands of Duncan's blood. 'Out, damned spot' and all that.

Where's the problem?

If she had a role that involved her coming into contact with bodily fluids, she would, of course, have been wearing disposable gloves, so there is absolutely no need to have a scene in which she implies that bodily fluids have come into contact with her skin. I suggested that we replaced this line of dialogue with:

'A damned spot on my single-use latex glove, I say! – One; two: why, then 'tis time to do't. Forsooth, I will dispose of them and then wash my hands using hot water and anti-bacterial gel before drying them. I will also report this incident to my line manager so that appropriate preventative action can be taken in the future.'

A very contemporary take on the original version but, alas, it's not written in iambic pentameter.

That, give or take a few short adjectives, is roughly what the director said.

And is that where this story ends?

Not quite, the final place where I suggested a change was Act V where we have the fulfilment of the prophecy that Macbeth would die when Birnam Wood came to Dunsinane. And this is where, I think, *In Practice* readers will be particularly interested.

Why?

Because I replace the whole battle scene with a seminar on regeneration of native woodland in medieval Scotland. What is more, enough eminent academic speakers are invited to ensure that a number of competing theories regarding the potential for regeneration are presented. This, in turn, opens the way to a production of Macbeth with alternative endings.

Don't tell me – the audience vote for the one that they prefer.

Exactly. I bring the production values of Reality TV to Shakespeare.

And what did the director say about that?

Let's just say she was succinct.

I'm sure she was. 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 6 April 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

Mr Daniel C. Alder, Miss Rebecca S. Aston, Miss Jan M. Baylis, Mr Nicholas J. Button, Mr Glen A. Cooper, Dr Richard Delahay, Miss Nina J. Fielding, Mr Matthew Hague, Mr Peter J. Hancocks, Mrs Jacqueline L. Hartley, Mr Mark Iley, Ms Carmen Jones, Dr Colin T. Kelleher, Mr Richard P. Kilshaw, Mr John Lamb, Ms Bernadette Lobo, Mr John A. McMullen, Miss Debbie A.R. Miller, Mr Ben Milner, Mr Richard D. Moores, Dr Mark A. Nason, Mrs Mary L. Norden, Mr Peter Nuttall, Mr David T. Price, Dr Helen T. Riley, Mr Alexander J.P. Scott, Ms Ann J. Sherwood, Mr Brian K. Stacey, Mr Alan E. Stealey, Mr Christopher J. Toohie, Miss Elisabeta Torok, Dr Gavin J. Wilson, Dr Richard W. Yarnell

APPLICATIONS FOR ASSOCIATE MEMBERSHIP

Mr Henry L. Andrews, Mr Lee Bullingham-Taylor, Miss Stephanie I. Coates, Ms Caitriona Cunningham, Mr Richard F. Dodd, Mrs Kirsty A. Hawkins, Mr Ross Holdgate, Mr Patrick Howard, Mr Owen T. Jones, Dr Carolyn Kenny, Miss Anna Langdell, Miss Carol J. Lea, Miss Kate Lyon, Mr Guillaume Marchais, Mr Lee A. Miles, Mr Christopher Richards, Ms Rhonda Ridley, Miss Catherine Sharp, Miss Marina Smith, Miss Jennifer Sneddon, Mrs Claire Storey, Mr John Wilsher, Mr Peter W. Wright

ADMISSIONS

IEEM is very pleased to welcome the following new Members:

FULL MEMBERS

Mr Richard A. Baines, Mr David Barker, Miss Laura Black, Mr Paul J. Dansie, Miss Michelle Dickinson, Mr Alexander Ewing, Miss Nicola Faulks, Mr Robert C. Grabowski, Mr Peter Hadfield, Mrs Margaret M. Haggerty, Mr Kevin Hand, Ms Kate Harrington, Ms Anne Harvey, Mrs Alison C. Hogan, Mr Michael D. Jones, Dr Marion P. Leppitt, Mr Guy Lowndes, Dr James R. Martin, Miss Tracey J. McLean, Mr Simon H. Mustoe, Mr Stephen J. Parr, Mr David A. Rees, Mr Tim Roderick, Dr Leslie Ruse, Mr Kieran A. Sheehan, Miss Karen J. Shelley, Mr Joshua B. Smithson, Dr Andrew J. Stanworth, Mrs Linda Swankie, Ms Karen V. Tanner-Tremaine, Dr Eliot Taylor, Miss Rachel Urwin, Mr Thomas B. Wigglesworth, Mr Martin J. Winter, Miss Elizabeth Wood

ASSOCIATE MEMBERS

Mr Graeme J. Ashton, Miss Joanne L. Atkinson, Miss Kate S. Baldock, Mr Colin F. Bonfield, Mr James S. Bowkett, Mr Murray C.D. Bracewell, Mr Michael J. A. Brown, Miss Sarah L. Clarke, Dr James G. Cook, Dr Sarah Dalrymple, Miss Abigail E. Dando, Mrs Tamsin J. Douglas, Miss Abbie Dowling, Miss Jessica Eades, Mr Francis P. Flanagan, Dr Rachel A. Freer, Mr David A. Green, Mr P. Leslie Hatton, Mrs Catherine Haynes, Mr Josh R. Hellon, Miss Rebecca L. Hill, Mrs Kelly Hollings, Mr Daniel Hone, Miss Kate E. Hunt, Miss Sarah Jennings, Mr Christopher R. Johnston, Mr Roger L. Jones, Mr Robert J. Kirkham, Mr David R. Lewns, Mr Terence C. Loughran, Miss Suzanne Lowry, Mr Dean Martin, Mr Nicholas P. Masters, Miss Rebecca E. May, Ms Maeve McLoughlin, Miss Louisa Medland, Mr Geoffrey J. Moxon, Miss Cathy Ovens, Miss Christine Parkinson, Miss Ellen Partington, Mr David Prince, Mrs Susan J. Redfern, Mr Thomas M. Reynolds, Mr Christopher J. Rochfort, Mr Jeremy A. Sabel, Miss Natalie R. Smith, Mr Timothy J. Smith, Mr John Sproull, Miss Lindsay E. Syme, Miss Lucy Taylor, Miss Jacqueline E. Thompson, Miss Naomi Waite, Mrs Amanda D. Williams

GRADUATE MEMBERS

Miss Stephanie E. Attwood, Miss Allison Austin, Mr Jonathan P. Ayres, Mr Lee A. Bagnall, Miss Jodie Ball, Ms Tania L. Beatty, Miss Victoria Bennett, Mr Stephen C. Bentall, Miss Karen A. Birdsall, Miss Sarah-Ann Boon, Mr Grant P. Bramall, Miss Abigail Bridge, Miss Kimberley S.J. Brown, Mr Joseph W. Bull, Miss Sally K. Chadwick, Miss Elizabeth Coleman, Mr John Condron, Miss Juli J. Coneybeer, Mrs Sara C. Cox, Mr Alexander C. Crossman, Miss Sarah Dale, Mr Matteo Dei, Dr Abraham I. Ejim, Miss Kerry L. Elliott, Mr Timothy D. Foster, Dr Emma L. Gardner, Miss Victoria Gilbey, Miss Catherine M. Greenhough, Mr Robin Hastings, Miss Laura M. Hicks, Mr Matthew Hobbs, Miss Gale Hodges, Miss Caroline Jewell, Mr Bruce W. Keep, Mr Alexander G. W. Kent, Mr Philip W.E. Knott, Mr Gonzalo Laserna, Mr Michael J. Launder, Miss Charlotte R. Lea, Miss Alexandra F.S. Mack, Miss Deborah J. Marchant, Miss Jo McDonnell, Mr Duncan C. McLaughlin, Miss Rebecca Miller, Miss Lisbeth M. Nash, Mr Thomas Owens, Mr Gareth J. Parkinson, Mr Edward Partridge, Miss Jennifer E. Rigney, Mr Paul Roebuck, Mr Karl D. Ruijsenaars, Miss Marielle N. Smith, Miss Eilidh I. Spence, Miss Anna Steele, Miss J. Madeline Tasker, Mr Paul D. Turner, Miss Rachael S. Twells, Mr Richard J. Warren, Mr Michael A. Williams, Miss Fiona Wilson

AFFILIATE MEMBERS

Mr Jonathan E. Abbatt, Mr Oliver E. Arthey, Mr Lewis A. Butlin, Mr Matthew Cobb, Ms Rose M. Cremin, Ms Andrea L. Gosse, Miss Lisa Hodgson, Mr Neil Hopkins, Ms Kirsty J. Kay, Miss Frances A. Luff, Miss Sarah Taylor,

STUDENT MEMBERS

Mr Simon A. Abel, Miss Katherine R. Allen, Miss Felicity Bates, Miss Fiona C. Berry, Miss Natasha Burdis, Mr Tony Corlett, Miss Rachel Craythorne, Mr John S. Dawson, Mr Thomas J. Docker, Mr Malcolm A. Fraser, Miss Elizabeth S. Furkert, Miss Claire Gibson, Mrs Elisabeth Greenaway, Mr A.K.M. Anwarul Haque, Miss Amanda R. Hine, Miss Carolyn Jewell, Ms Karen Jones, Miss Sayaka Maeda, Miss Abiola M. Marcus, Mr Peter Newbold, Mr Ryan J. Oakley, Mr Abidemi I. Oduntan, Miss Stephanie Pilborough, Miss Jacqueline Platt, Miss Anna Rawlings, Ms Sara V. Robin, Miss Hannah Rose, Miss Rosemary L. Shoosmith, Miss Linda Stark, Miss Victoria Strawson, Miss Cressida Wheelwright, Mr Kevin Wood, Mr Laurence Wright

UPGRADES

The following have successfully upgraded their Membership:

ASSOCIATE to FULL MEMBERSHIP

Mrs Lois Browne, Mr Laurence D. Burrows, Mr Alastair Chapman, Miss Victoria Chapman, Mr Joseph Deimel, Mr Marcus Fry, Miss Hannah Graves, Mr Simon D. Inger, Mr Peter Johnstone, Dr Alan D. Kirby, Miss Gemma Lee, Dr Tessa McGarry, Miss Ali Morse, Mrs Clare O'Reilly, Mr David Scholefield, Miss Elizabeth Seal

What's on April – June 2007

2 April 2007.
Ecology and management of the unique grassland habitats of North East England.
Newcastle upon Tyne.
IEEM North East England Section conference.
www.ieem.org.uk/NE%20Events.htm

4 April 2007.
Insects and agri-environment schemes: lessons from research in arable landscapes.
Harpenden, Hertfordshire.
Insects and Sustainable Agriculture Special Interest Group Meeting.
www.royensoc.co.uk

17-19 April 2007.
High Value Grassland: providing biodiversity, a clean environment and premium products.
University of Keele, Staffordshire.
A BGS/BSAS/BES Conference.
www.britishecologicalsociety.org

18 April 2007.
Developing Best Practice in Survey and Reporting.
London.
IEEM Spring Conference.
www.ieem.org.uk/Conferences.htm

18-19 April 2007.
Biodiversity: meeting your obligations in the planning system.
Oxford.
Oxford University contnuing education course. www.conted.ox.ac.uk/env

19 April 2007.
Far from moderate - the human impact on the natural environment of the Falkland Islands and South Georgia.
London.
Evening meeting of the Linnean Society.
www.linnean.org

26 April 2007.
Flood alleviation schemes - benefits and impacts.
Carlisle.
IEEM North West England Section event.
www.ieem.org.uk/NW%20Events.htm

1-2 May 2007.
Using PC-ORD to Analyze Multivariate Community Data.
Galway, Ireland.
peckj@umn.edu

5 May 2007.
Shropshire Reptile Atlas Talk.
Preston Monford, Shropshire.
vivgreen@shropshirewt.cix.co.uk

22 May 2007.
International Day for Biological Diversity: Biodiversity and Climate Change.
www.biodiv.org/programmes/outreach/awareness/biodiv-day-2007.shtml

22-27 May 2007.
Eco Summit 2007.
Beijing, China.
Ecological Complexity and Sustainability: Challenges and Opportunities for 21st Century Ecology.
www.ecosummit2007.elsevier.com

25 May 2007.
First European Environmental Verifier Day (EEVD).
Brussels, Belgium.
An EFAEP event. www.efaep.org

29-31 May 2007.
Working Towards Changing Perspectives in Coastal Dune Management.
Snowdonia National Park, north Wales.
Part of the UK Sand Dune and Shingle Network. www.hope.ac.uk/coast

5-6 June 2007.
Wildfire.
Dalby Forest, North Yorkshire.
Promoting good practice in wildfire management. www.wildfire2007.org.uk

6 June 2007.
Managing the Marine Environment.
London.
Free Earthwatch Institute lecture.
www.earthwatch.org

6-8 June 2007.
Bat Echolocation: Monitoring and Interpretation Workshop.
Dumfries and Galloway, Scotland.
www.echoesecology.co.uk

12 June 2007.
Managing Biodiversity in a Changing Climate.
Oxford.
Oxford University continuing edcation course. www.conted.ox.ac.uk/env

12 June 2007.
Global Amphibian Declines.
London.
Institute of Zoology scientific meeting.
www.zoo.cam.ac.uk/ioz/index.htm

12-13 June 2007.
1st International Symposium on Nematodes as Environmental Bioindicators.
Heriot-Watt University, Edinburgh.
www.aab.org.uk

27 September 2007.
People and Wildlife in National Parks.
Loch Lomond and Trossachs National Park, Scotland.
IEEM Scottish Section conference. www.ieem.org.uk/Scottish%20Events.htm

13-15 November 2007.
Ecological Networks.
Nottingham.
IEEM Autumn Conference.
www.ieem.org.uk/Conferences.htm

IEEM workshops with places still available:

7 April	Great Crested Newts
19 April	Woodland Flora
27 April	Roads and Wildlife
2 May	River Survey
16-17 May	Bats
24 May	Woodland
6 June	Plant Identification
24 May	Woodland

More information - www.ieem.net

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

Centre for Alternative Technology
01654 705950
www.cat.org.uk

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

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

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

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