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Birds and Water

Dr David Hill, FIEEM

Introduction

In this article I explore some key topical areas concerning birds and water from the perspective of an ecological consultant and I look to areas where we, as ecologists, may be expected to provide advice in the future.

The subject is huge, complex and often habitat and species specific. Although I shall necessarily take a very broad view, I shall limit my definition of waterbird strictly to waterfowl comprising wildfowl (swans, geese and ducks) and waders. Of course, many groups of birds rely on or use habitats which contain water in some form, but in the main, the bulk of the ecologists' work in this area, especially in the UK, involves giving advice about waterfowl. The UK is home to a large number of waterfowl species during the overwintering period (September – March). Internationally important numbers of many populations that breed in western and eastern Europe, and above the Arctic Circle from Canada to central Siberia, migrate, to overwinter in the UK. In general terms the predominant habitats of interest in the context of these overwintering waterfowl are the larger inland waterbodies such as valley and impounded reservoirs, lakes and gravel pits, and estuaries.

All of the above habitats are influenced in some way by man. The water companies control the reservoirs. Ancillary activities including water-based recreation, nature conservation and angling usually occur on them in partnership with the water company. A large number of interest groups from local authorities, industry, water companies, statutory agencies, fishermen, sport recreation participants, nature conservation bodies and many others, have an interest in our estuaries. The potential for conflict between use and opportunities for protection and conservation are therefore immense across all these habitats.

One only has to read the annual reports of the water companies to appreciate the importance they now place on integrating ecology and nature conservation in all that they do. Some of the reservoirs, built specifically to provide water to a human population with increasing demand, have become of substantial importance to waterfowl during their annual cycle. As a result of increased legislation, companies owning and controlling these man-made features have a duty to account for the impacts of their water-providing function on the nature conservation resource. At the same time, their primary function as water providers is paramount and on numerous occasions we have been asked to assess the balance between this and ecology. Increasing pressures for development on estuaries and coasts from as diverse a range of facilities as waste incineration, petrochemical plants, power stations, flood defences, sewage treatment works, pipelines, ports and cargo terminals, has dramatically increased the need for the ecologist to balance the aspirations of the developer with the requirements of the legislative process.

Major initiatives in recent years

Without doubt, the ecological and environmental profession is driven by legislation. The extent, complexity and enforcement of this legislation has increased beyond recognition in the past 15 years. From the point of view of delivery of our services, the two most significant pieces of legislation are the EU Birds and Habitats Directives, implemented under UK domestic law by the Habitats Regulations. In addition, of substantial importance have been the EIA Directive and the Water Framework Directive. These four should in practice work in association in order to strengthen protection and to guide 'sustainable development'.



bittern

The designation of Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) under the EU Birds and Habitats Directives respectively, has increased statutory protection, and given clearer guidance as to those species, communities and habitats of interest at an international (European) level. The Ramsar Convention also provides additional weight, especially given the increased importance of Ramsar sites afforded by the Countryside and Rights of Way Act (2000). But in addition to these statutory measures, the non-governmental organisations, principally the RSPB, have worked hard in the past 20 years to protect sensitive sites from major sources of disturbance, especially hunting and through contributing as a consultee to the planning and development control process. In respect of the scientific basis for setting up disturbance free sites, the work of Jasper Madsen and Tony Fox in particular, has demonstrated through large-scale experiments, that hunting has a disproportionate 'effect' on waterfowl by rendering as unattractive otherwise highly suitable habitat for them. The results of this work came long after the RSPB increased site protection from hunting by purchasing additional land at sites such as the Ouse Washes in Cambridgeshire.

Demonstrating that various sources of disturbance have a population impact (bird numbers decline) rather than an effect (bird distribution is affected but numbers stay the same) has, however, proved elusive. The pioneering work of John Goss-Custard on wading birds, principally the oystercatcher, in which he has modelled factors affecting energy expenditure and subsequent

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No journal such as this can really let the passing of the Johannesburg Summit go unnoticed.

Although the general perception has been one of disappointment there are some points where the cause of biodiversity conservation has been advanced. These are in the conservation of fish stocks and the framework for marine nature reserves. Small gains perhaps, but with the failure of the United States to show any real commitment to the Summit and the failure of President Bush to attend, progress was always going to be limited. Don't forget the United States has still not signed up to the CBD - Convention on Biodiversity. But the attempt to connect biodiversity issues to society as a whole, which many saw as being a limitation of the Rio Conference has to be a positive outcome. However, within the wider political arena it is far more difficult to secure agreements and it is probably a useful lesson for conservationists to learn.

The water and sanitation targets have to be welcomed but there is no mention of river basin management nor sustainable development.

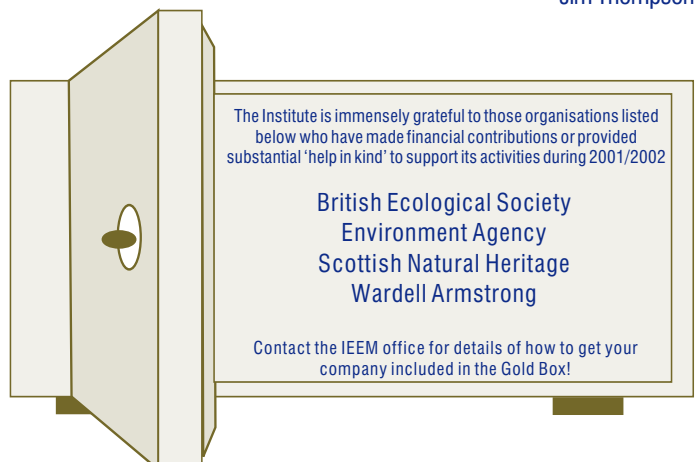
As far as biodiversity and ecosystem management is concerned, the commitments are as follows:

- Commitment to reduce biodiversity loss by 2010.
- Commitment to reverse the current trend in natural resource degradation.
- Commitment to restore fisheries to their maximum sustainable yields by 2015.
- Commitment to establish a representative network of marine protected areas by 2012.
- Commitment to improve developing countries' access to environmentally sound alternatives to ozone depleting chemicals by 2010.
- Undertake initiatives by 2004 to implement the Global programme of Action for the Protection of the Marine Environment from Land Based Sources of Pollution.

Also the UN has received 32 partnership initiatives with 100 million dollars in resources and the United States has announced 53 million for forests in 2002 - 2005.

One of the other issues raised at the Summit was the impact of food production subsidies on third world agriculture and here there is a clear link to the discussion over the future of the Common Agricultural Policy (CAP), so much the object of criticism. The creation of agricultural surpluses from production subsidies has led to substantial amounts of food being dumped in developing countries. In turn this has led to reduced income for local farmers and a flight from the land into the cities, creating a vicious circle of dependence. This is a cause currently being championed by Action Aid and it is interesting how this issue can find common cause with conservationists wishing to curtail subsidised agriculture because of the adverse effects on biodiversity. Commissioner Fischler would do well to take this dimension into account when considering the future of the CAP.

Jim Thompson



mortality given different environmental and population density dependence parameters, has contributed significantly to our view of the potential for intertidal habitat loss and disturbance to cause a population impact.

In parallel, the policies of the RSPB and to a lesser extent the various Wildlife Trusts and Wildfowl & Wetlands Trust, which have included increasing reserve size, reducing fragmentation of existing reserves, and the acquisition of new reserves, has provided a substantially larger area of refuges for waterfowl. Many of these are also SPAs and SACs, the latter fulfilling a function for ecological groups other than birds. The influence of the RSPB in securing such sites is compelling.



shoveler

Species trends

The SPA network in the UK holds more than 2 million waterbirds which is about 40% of the UK total, most of which breed in the Arctic (source : RSPB 2002). Although it is impossible to assess this same figure for, say, 20 years ago, the recent publication 'The state of the UK's birds 2001' provides a useful analysis of waterfowl trends for the 30-year period between 1970/71 and 1999/00 using data from the Wetland Bird Survey (WeBS). Populations of wintering waders and wildfowl have shown major increases, with populations having, on average, more than doubled over the last 30 years. The report suggests that although the reasons for species specific differences in trends vary, the overall impression is that the increases are as a result of a greater recognition of the value of wetlands for wildlife. In addition, I would argue that there is also a greater recognition of the importance of wetlands to man, either as a provider of water or as a place to play or facilitate wealth creation through appropriate development. Again, the balance is all important. The various international treaties and legislative mechanisms have secured an international network of refuges that act as refuelling stop-overs and overwintering sites for waterfowl.

With the exception of knot and bar-tailed godwit, the numbers of most waders that overwinter mainly on UK estuaries have either been stable or have increased in the last 30 years. Ringed plover, sanderling, purple sandpiper and turnstone, which winter mainly on non-estuarine coasts, have actually declined by between 15 and 21% between 1984 – 1998. Climate change has been implicated as a possible reason for these declines. In a project currently underway, the decline in Ringed Plover on the Medway estuary has significant implications for a study to inform the Appropriate Assessment which we are producing for our client. These potential distributional shifts at a whole population level, possibly due to macro-environmental factors, need to be taken into account when undertaking such studies. Clearly, the long-term datasets of the BTO and Wildfowl & Wetlands Trust can be of unique importance in this regard.

Some wildfowl species are doing especially well. The increase in gadwall (> 1000% increase between 1969/70 and 1999/2000) may be due to the continuing growth in numbers of continental breeding birds that form the majority of the wintering population, in addition to an increase in the UK

breeding population. The habitats favoured by the species such as artificial reservoirs, maturing gravel pits etc., have also increased substantially in area, linked to our own increasing demand for water and aggregates. Some wholly artificial sites, such as seven waterbodies near the M4/M25, have been made components of the South West London gravel pits and reservoirs SPA, largely on the basis of two species, gadwall and shoveler. There will undoubtedly be a continuing debate between owners (water companies and aggregate companies) concerning the long-term responsibilities for securing waterfowl populations at this and similar sites, and the duties of the water providers and company development in relation to their customers and shareholders. I come back to this later in the article.

In terms of trends in other wildfowl species, to take a few examples, there have been significant increases also for shelduck (27%), wigeon (41%), tufted duck (61%), mute swan (84%), shoveler (119%), pink-footed goose (219%), pintail (242%), dark-bellied brent (291%), teal (347%), grey plover (456%) and black-tailed godwit (648%), Whooper and Bewick's swans have been recorded in record numbers in recent years probably as a result of lower mortality linked to protection at traditional refuge sites such as the Ouse Washes and Martin Mere and perhaps to provision of food either artificially or as winter sown cereals.

Overall, the message is that our waterfowl populations are doing very well and that the policies of refuge creation, site enlargement and disturbance reduction, are providing sustainable habitats over a substantial area which operate as a network linked to other sites in Europe.

Wetland habitat management

The process and execution of wetland management has been, until recently, perhaps most highly developed in the United States. Much of their management is effected under state control. In the UK, however, much of the wetland habitat creation and management is undertaken by non-governmental organisations such as the RSPB and Wildfowl & Wetlands Trust, as well as by water companies. Such sites are perhaps relatively less complicated to establish than other habitat types given sufficient amounts of water and appropriate control over flows and levels. In addition, they are excellent places for people to see birds – wild expanses of estuary mudflats, with appropriately located hides near to high tide roosts or feeding areas, large wetland 'scrapes' such as built at Minsmere, again with hides positioned so as to increase the chance of people seeing birds most of the time and, on a good proportion of occasions, large numbers of wetland birds.

There has been a wealth of publications on wetland habitat management, with key texts perhaps being wet grassland guide, reedbed guide, Wildlife Trusts manual, Sutherland and Hill; WWT Merritt. RSPB also produce an excellent series of management case study reports. Alongside the increase in practical literature has been an increase in stakeholder participation through such tools as estuary and coastal management plans, local biodiversity action plans, and local site plans for habitat creation as a consequence of planning conditions requiring mitigation or compensation for development. Given a more coordinated yet flexible planning system, industry would almost certainly make a much greater contribution to wetland conservation in the UK. In my view, whilst the scientific basis of, and management prescriptions for, the establishment of new wetland habitats is reasonably well understood and available, it is currently an under-utilised tool in the planning and development control profession and a subject to which I shall return.

Key issues affecting wetland habitats and birds

Some of the key features which determine the use of wetland habitats by birds are water levels and the periodicity of their fluctuations, the consistency of water availability, disturbance levels, and productivity.

There has been a significant amount of work undertaken by the RSPB on water level management, either to guide the management on their reserves, or to inform policy development which feeds through to better stewardship of in

large tracts of land such as the Somerset Levels and other such areas. With the appropriate control of predators, water level management is essential for maintaining high densities of breeding waders on wet grassland.

For the bulk of waterfowl that winter in the UK, however, i. e. those using estuaries or inland waterbodies, the dependency on water levels is obviously different. The highly productive nature of most estuaries and the daily inundation of mudflats, is somewhat akin to a less rapid system of food provision and accessibility as occurs under inland non-tidal waters. For example, the gradual drawdown and subsequent refilling of both impounded and valley reservoirs, in response to the normal requirement for water abstraction, has been shown to affect bird populations less than in situations where water levels are dropped artificially more quickly.

At Abberton and Staines reservoirs, for example, necessary management works have required that these reservoirs (both SPAs – Staines being a component part of the SW London SPA), be drained quickly. The subsequent increased availability of otherwise inaccessible food supplies afforded by the shallow water retained in them, coupled with increased productivity during the period, has led to phenomenal increases in wader and wildfowl populations for a relatively short time. Normally, these periodic but necessary management activities might be planned to avoid the peak overwintering period, especially if the activities are considered by the statutory authorities to warrant an Appropriate Assessment. However, longer-term studies should aim to determine the long-term effects of such works on waterfowl and generic guidance should be set to give confidence to the water companies as to how such works should be undertaken, without the need for an Article 6 approach in each case. It may be found, for instance, that some rapid draining has long-term benefits. This guidance is slowly happening, but one can appreciate the frustrations of the site managers who have a duty to undertake works but which may be deemed as damaging by the statutory consultee. Again, the advice of the ecologist is often sought.

Impacts on wetland bird communities

In addition to wetland habitat management, the area which occupies much of our time as consultants relates to the determination, measurement, and prediction of impacts. Once impacts have been identified, quantified and/or predicted, mitigation for impacts is developed and tested in terms of the significance of potential impacts which remain (residual impacts).

Most impacts relate either to direct habitat loss or indirect effects which render a habitat unusable, such as disturbance activity. For sites designated as of European importance on the basis of their waterfowl populations, impact assessment is usually of the latter type since direct loss of habitat would usually result in a sustained objection from the government's conservation advisers. Familiar impacts on inland sites relate to such activities as increased water abstraction from reservoirs, applications for water-based recreation facilities, and extensions to gravel extraction. Impacts on estuaries which will be familiar to ecologists are more wide ranging and in our experience include developments such as power stations, energy from waste plants, new roads, factories, rail freight depots, docks and ports, business parks, marinas, sewage outfalls, flood protection and coastal defence works, pipelines, and deposition of dredging materials.

Where European sites such as SPAs are concerned, developments such as these, which occur adjacent to them or within a 2km consultation distance to them, will usually require a study to inform an Appropriate Assessment under the Habitats Regulations, irrespective of the fact that habitat will not be lost from the European site.

Procedures for European sites

The key parts of the Habitats Directive that relate to planning and development control, and hence the assessment of impacts from a development, are Articles 6(3) and 6(4). The procedure is known as an Article 6 assessment. Briefly, Article 6(3) refers to the need for an Appropriate Assessment and that a project can only be permitted if it will not adversely affect the integrity of the site. Planning Policy Guidance 9 on nature

conservation defines the integrity of a site as 'the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or levels of populations of the species for which it was classified'. The lawyers love this definition. As a scientist I would argue that site integrity is particularly difficult to define. If 1%, 5%, 10% or none, of the ecological resource is affected or lost, how is this transposed into an effect on site integrity? Studies and debate are urgently needed on this subject so as to have scientific credibility.



grey heron

The process of Article 6 assessment has four stages : screening, Appropriate Assessment, assessment of alternative solutions, and assessment where adverse impacts remain (compensation). Only where imperative reasons of overriding public interest (IROPI) can be demonstrated could developments which affect the integrity of a European site, be allowed to proceed. But to do so adequate compensatory measures need to be developed and put in place. Projects or plans that serve only the interests of companies or individuals are not covered by the IROPI test. Stricter control is supposed to emanate from 1998 government guidance which stated that 'Government expects there to be few cases where it is judged that imperative reasons of overriding public interest will allow a development to proceed which will have an adverse effect on the integrity of internationally important designations'. Only factors such as a need to address a serious risk to human health or safety, in the interests of national security, a direct environmental benefit of national or international value, a vital contribution to strategic economic development or regeneration, or where failure to proceed would have unacceptable social and/or economic consequences, would pass the IROPI test.

The Habitats Regulations implement the Habitats Directive. Of particular relevance to Appropriate Assessments and the IROPI test are Regulations 48(1), 48(2), 48(5), 49(1), 49(2), 50 and 55-59.

Mitigation and compensation

Although much of the planning and development control profession advocate and rely on mitigation measures, the principles of mitigation and the database of examples, are poorly documented. This, I believe, will be the next new area to burgeon as the scope for development becomes increasingly constrained by the legislation. The advancement of protection, designation and enforcement, could suddenly ignite a political backlash from industry and the development community. My view is that as professional ecologists, we should be looking more seriously at the efficacy, scale and location of mitigation and compensation schemes. In particular, there is tremendous scope for new wetland habitat creation under a 'mitigation banking' framework

the UK, similar to that operating in the United States. The basic idea is that industry or the development proponent, creates new or enhances existing habitat according to set criteria. Those with land available for such schemes are brought into the process. Those with projects they wish to pursue then buy into the process perhaps providing resources to create or enhance between 2 – 50 times the areas of land potentially affected by the development (= the compensation ratio).

I intend to pursue the application of this process in a professional capacity in the coming years. It offers the hope of much better and properly resourced habitat creation and management, at a spatial scale which can deliver major ecological gains. My view of most existing mitigation schemes is that they are often badly designed, contain too much engineering input, are not properly monitored, are often in the wrong place (small scale on-site mitigation within schemes adjacent to or involving wetlands is often a waste of time), and finally are not assessed or enforced by the bodies who conditioned them as part of the planning permission. Whilst there may be difficulties in gaining acceptance of compensation schemes set up outside the political boundary in which the development to which it relates is based, I believe the gains could be worth the effort.

For the same reasons that wetland reserves have been successfully established for many years, bringing pleasure to many people and creating major habitats for birds, some of the most successful compensation schemes are likely to involve wetland creation and long-term management. It would not be unnatural for the driving force for such areas to be for birds if indeed the compensation is required in respect of a development which has the potential to impact on an important bird community. Topical at the moment are the proposals for a massive airport in the south east, with one option being at Cliffe Marshes adjacent to the Thames estuary. Mitigation within

the boundary of the SPA may not, in all probability be possible. Compensation would doubtless need to be on an equally massive scale and location should not be constrained by political or administrative boundaries.

Conclusions

Water providers are generally proactive in fulfilling their duty to integrate ecology and nature conservation with appropriate development and water exploitation. The ecological profession, driven by the legislation which places such a duty, must constantly keep abreast of new approaches for giving advice to them. Some of the areas likely to require major levels of work in the future include debating and clarifying the scientific basis and interpretation of site integrity and what constitutes an adverse impact. Better population analysis of wetland birds in relation to resource exploitation and hence the manifestation of potential impacts from man-induced activities, is required. How to deal with species protection on wholly artificial sites such as reservoirs which have attained European site status for birds, where operational and management actions are mandatory and site lifetime is finite, needs to be resolved. Long-term studies on mitigation measures are required in order to provide consistent advice. The efficacy, scale and location of mitigation and compensation schemes needs research and debate and such schemes should be larger, more innovative and not constrained by political or administrative boundaries.

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Ecological Benefits of SUDS

Iris de Jongh, MIEEM

Sustainable Urban Drainage Systems (SUDS) are used more and more at new developments. Not only do they improve water quality of the runoff and reduce flood risk by balancing peak flows, but they can also increase the ecological value of a development site. Previously a new development often meant a loss of habitat. SUDS can provide some mitigation and even opportunities for the creation of more interesting habitats than were present on the site.

The main potential for ecological benefits are:

Water quality improvement

Pollution of watercourses can cause long-term damage to the productivity and diversity of a habitat. Through filtration and biological treatment SUDS provide good removal rates of pollutants before discharge.

Habitat creation

SUDS provide opportunities to create a whole range of habitats such as water features, including ponds and reedbeds, vegetated roofs and vegetation corridors of native grasses and wildflowers.

Providing green and/or blue corridors

SUDS are usually constructed in chains through the development to watercourses and/or open spaces on the edge of the site. They can therefore, provide migration routes into and through a development, especially when plenty of vegetation is present to provide cover for wildlife. Those routes can add significantly to the wildlife corridor features of a site.

Maintaining area specific eco-hydrological characteristics:

Traditional urban drainage systems were designed to transport rainwater to a treatment facility or rivers very quickly. Only a small amount of water could seep to the groundwater and then slowly flow towards a river. Traditional systems changed both the geohydrology and the hydrology of a catchment resulting in a shift in eco-hydrological characteristics. By mimicking the natural drainage characteristics of a catchment, SUDS minimise changes to the eco-hydrology.



Swale just after Construction

From an ecological perspective there are 4 main types of SUDS:

Permeable surfaces have a low ecological value as such, but do provide good treatment rates and help to maintain the area specific eco-hydrology.

Swales and Filter strips are larger areas within the development, or strips of a few metres wide alongside roads. They can be planted with grasses, preferably slow growing native grasses, and wildflowers. When provided with sufficient cover they provide excellent corridors between water features like ponds, wetlands and watercourses.

Ponds and wetlands can be planted with a variety of reeds and submerged and floating waterplants. They can provide a good habitat for birds, insects, amphibians, fish and benthic fauna, especially when pond and wetland features are connected to each other. Bats can also benefit from these insect rich environments, even more so when bat boxes are placed in the vicinity.



Wetland and pond for road runoff

Green roofs can initially be planted with mats of stonecrops (mostly *Sedums* of the *Crassulaceae* family), but other grassland and rock species are also available. The initial vegetation mat promotes the natural generation of other vegetation, because it helps create a stable environment by forming humus from decaying plant tissue. Stonecrops provide a fertile soil and prevent the seeds of colonising plants from being washed away.

Different types of SUDS enhance the ecology in a development in different ways, some more than others. It is therefore important to include a variety of SUDS in the designs. However, there can be limits to the types of SUDS that would be suitable. The choice will depend on soil characteristics, groundwater quality protection status, groundwater levels and available space.

Planting or seeding a large variety of, preferably local, species and constructing the SUDS with a variety of (water) depths provides a habitat with a potentially high biodiversity. The designs would also benefit from well-chosen networks that connect to suitable corridors at the edges of the development.

SUDS are drainage devices in the first place, but with a few simple adjustments there is a lot of potential for ecological enhancement. An interdisciplinary approach is essential for best ecological practice in SUDS design.

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The end of great crested newt licensing as we know it?

Andrew Baker, MIEEM

Over the past two years major changes have been made to the way in which the UK governments implement the 'system of strict protection' which is afforded to those species which are listed under Annex IV (a) of the Habitats Directive. In January 2000 the UK's translation of the Habitats Directive in to the Habitats Regulations 1994 was found to be wanting (see In Practice No 28, May 2000 'Protected Species Legislation Re-defined!'). The EU issued a 'reasoned opinion' which made it clear that the licenses which had been dished out to ecologists to move Great Crested Newts on the grounds that moving the animals out of the way of development was considered 'conservation', was in effect illegal. The EU reasoned that in cases of development European protected species licenses could only be issued under Article 16(1) (c) of the Directive (Regulation 44 (2) (e) of the Habitats Regulations) . This meant that in order to derogate from the strict system of protection the following tests would need to be satisfied.

1. There is no satisfactory alternative to the development
2. The derogation will not be detrimental to the species concerned
3. The development is in the interests of imperative reasons of overriding public interest.

Given that tests 1 and 3 are essentially issues which can only be addressed through the planning system, the issuing of licenses was moved from English Nature (EN) and the Countryside Council for Wales (CCW) to DEFRA and the Welsh Assembly respectively. EN and CCW were only consulted in respect of test number 2. In Scotland licensing had always been handled by the Scottish Executive.

Unfortunately this did not put an end to the confusion which has always accompanied protected species licensing. Although DEFRA were issuing the licenses, they were effectively relying on the Local Planning Authorities (LPA) to provide the justification required under tests 1 and 3. Many LPAs however, continued to grant planning permission without considering the tests, simply leaving protected species issues to licensing. A bureaucratic loop was established which in the opinion of the author and many others left protected species licensing where it had always been - on the edge of legality. Despite the issuing of interim guidance in England, Wales and Scotland the confusion continued not least within the LPAs which were unclear whether or not they had to consider the two tests (In Practice No 35 March 2002 "Deconstructing EU Wildlife Legislation", Greg Carson). It would appear, however, that things may be about to change.

On the 10th June 2002 the Welsh Assembly issued a consultation paper on legislative proposals for integration of the conservation of European protected species with the land-use planning system. The consultation paper includes suggested changes to the law and draft guidance for LPAs. The aim of the legislation is to provide a specific obligation for LPAs to consider Article 16 of the Habitats Directive over and above Regulation 3(4) of the Habitats Regulations which requires LPA's to 'have regard to the requirements' of the Directive.

The Assembly has proposed changes to both the Habitats Regulations 1994 and for the sake of consistency the Wildlife and Countryside Act 1981. Specifically five proposals have been put forward.

Proposal 1 places a statutory obligation on the LPAs not to grant planning permission which would result in the breach of the strict protection unless the provisions of Article 16 have been met (i.e. the 'three tests').

Proposal 2 provides a new defence against offences under the Habitats Regulations which covers activities done in accordance with a planning permission where the authority was aware that protected species are present and derogation was granted as part of the planning permission.

Proposal 3 confers a statutory obligation on the LPAs to consult CCW for advice on whether derogation would be detrimental to the species concerned (i.e. to consider the second test).

Proposals 4 and 5 set out procedures for situations where LPAs disagree with CCW's opinion and ensure that all derogations are reported to DEFRA to fulfil the UK's reporting obligations under the Directive.

The draft guidance offers further clarification on the way protected species are to be treated within the planning system. The following are the key aspects of the draft guidance:

- Significantly the draft guidance raises the importance of the consideration of European protected species from a 'material consideration,' a familiar phrase from the now very outdated PPG9/TAN5. The Welsh proposal effectively draws a clear distinction between European and other protected species which previously did not exist.
- The draft guidance puts the onus on the LPA to assess whether a development will affect a European species (no guidance is given on how to ensure that protected species are identified and there is limited advice on what constitutes a breach of strict protection. Nor is there any requirement to consult CCW at this stage in the process)
- Whenever possible LPAs should work with the developer to avoid the need for derogation at the earliest possible stage in the planning process. This places a greater emphasis on the concept of impact avoidance rather than impact mitigation.
- The guidance offers advice on the meaning of 'no satisfactory alternative' including withdrawal, revision and re-submission of a proposal but interestingly does not consider alternative sites.
- The need for sound ecological information and assessment is highlighted.
- To ensure that the second test is met it is expected that planning conditions will be used to secure the implementation of mitigation plans and that these conditions be enforced through existing procedures under the Town and Country Planning Act.
- Where an LPA disagrees with CCW's advice the LPA is expected to provide a reasoned, scientific explanation as to why it disagrees.
- Limited guidance is given on how a development would qualify as being of imperative, overriding interest.

The Welsh Assembly proposal and the effective demise of European protected species licensing would have far reaching implications for LPAs and local government ecologists. The proposed changes will require a high level of input from LPA ecologists with obvious implications for resourcing the time and skills required. It also raises the question of how LPAs that do not have their own ecologists will cope with this new area of work. LPA planners will need to become much more familiar with the Habitats Directive and the application of tests 1 and 3 to ensure that they are applied correctly and consistently both within and between LPAs.

In my first article on European protected species back in May 2000 I concluded by saying that "Schedule 2 species have, in effect, been elevated to the centre of planning policy, development and control". It would appear that after almost two years the mechanisms to achieve this are beginning to be put in place. The Welsh Assembly has lead the way and it is reported that a draft bill will be put before the Scottish Parliament in the Spring of 2003. The main questions now are if, when and how England will follow suit?

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Wicken Fen: the next 100 years, the next 10,000 acres

Adrian Colston, MIEEM

Wicken Fen is Britain's oldest nature reserve, and celebrated its 100th anniversary in 1999. The first two acre strip was purchased on May 1st 1899 and donated to the National Trust. Fifty five conveyances later, the reserve is over 800 acres. Wicken Fen is the third largest reserve in Cambridgeshire, after the Ouse and Nene Washes. Nonetheless, it represents only a tiny fragment (0.08%) of the thousands of square kilometres of fenland that existed before the great drainage projects of the 17th century.

The Fen has been managed traditionally for centuries by sedge cutting and peat digging. This management has produced a unique fenland habitat, rich in wildlife, particularly invertebrates. The fen supports a large number of *Red List* and Nationally Scarce insect species. Over 7,000 species have so far been identified on the Fen in all taxa, including more than 121 that are included in the *Red List* of rare invertebrates.



Aerial photo of Wicken Fen © S. Muller

The value of the Fen is recognised by a host of designations, as a National Nature Reserve, a Site of Special Scientific Interest, a Special Area of Conservation and a Ramsar site. These designations have been principally made on account of the open fen habitats of sedge beds, reed communities and fen meadows.

Wicken Fen is unique in landscape terms. A remnant of the once massive Cambridgeshire Fens, it preserves a true sense of wetland wilderness. Standing in the middle of the reserve, nothing is visible other than wild habitats of fen, water and woodland. Outside the boundary is an expanse of carrot fields and intensive farmland, but within is an ancient landscape of great diversity and aesthetic appeal.

However the population size of most of Wicken's resident species is comparatively small and for some organisms, numbers are dangerously near the limit for long-term survival. At Wicken, the replenishment of a diminishing or lost population now requires long journeys across a dry arable landscape. Even for a site the size of Wicken Fen extinction of species is a big problem. The extent and scale of the Reserve along with its isolation from other similar habitat types has also undoubtedly led to many of the problems.

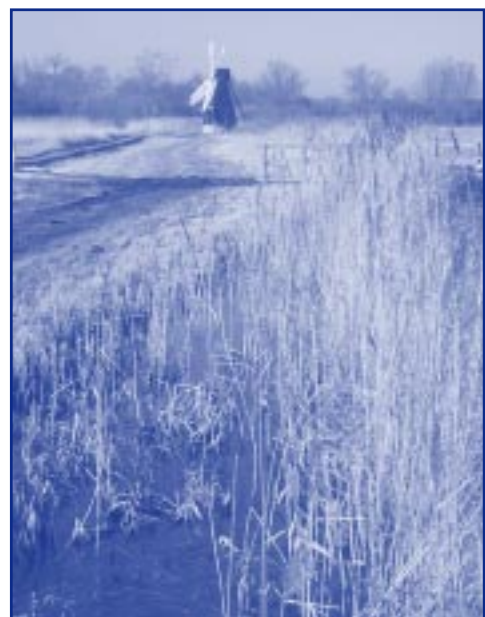
It was recognised in the 1990s that in order to secure the future of East Anglia's fenland flora and fauna, it would be necessary to think beyond the bounds of the existing tiny fragments of wetland. In 1996, the *Wet Fens for the Future Project* was launched, collaboratively between a series of conservation organisations. The idea that large artificial wetlands of great conservation value can be created is long established in the fens. In Cambridgeshire, over 5060 hectares of SSSI has been created by human action. This represents 54% of the total area of SSSIs in the county. In Cambridgeshire just two sites, the Ouse Washes and the Nene Washes, (both created for drainage) represent over 41% of the total SSSI area. Both are of international importance. Habitat creation projects have already improved the county for wildlife.

In the late 1990s, the National Trust identified the desirability and feasibility of extending the boundaries of Wicken Fen. This would make it possible to maintain populations of fen flora and fauna over a wider area. The Trust proposed therefore to acquire up to 10,000 acres of farmland to the south of Wicken Fen over the next 100 years. This area includes the catchment supplying water to Wicken Fen.

The key to wetland restoration lies in the restoration of a suitable hydrological regime. The area is divided into a number of hydrological units by 'Lodes' and drainage ditches and therefore piecemeal restoration of the landscape to various types of habitat can occur without the need to own the entire area. The whole of the proposed enlarged reserve lies within the boundaries of the Swaffham Internal Drainage Board. The wetlands of the area would be restored by a combination of natural regeneration and the raising of water levels via a reduction in drainage pumping and the use of sluices.

Restoration of a fen system, with a patchwork of habitats ranging from open water through to scrub, according to topography, might be achieved within a decade or so once re-wetting is achieved. Ongoing management would be very low-input, using large grazing animals.

The scheme depends on an extensive land acquisition policy; the area is a patchwork of holdings owned by around 120 individuals and acquisitions can only proceed with their approval. Any such acquisition policy would have to be on a timescale of several decades, say, over the next 100 years or more.



The Fen windpump and landscape

Public benefits of the project

The project offers a broad range of potential public benefits. The economy of the county is widely acknowledged to be one of the fastest growing in the UK. There is a huge desire in the City to promote Cambridge as the high technological capital of Europe. There is as a result a large amount of inward investment occurring with many prestigious multinational firms locating to the area to utilise the highly skilled workforce and research potential of Cambridge.

Associated with this growth is the prediction that by 2025, 105,000 new houses will need to be built. The Wicken Fen Vision offers a potential counter-balance to the inevitable housing development by providing areas of open countryside, which are accessible to the public. The extended reserve could act as a 'Green Lung' for Cambridge and beyond as well as dramatically improving the 'quality of life' for local residents and users alike.

Access to the countryside around Cambridge is currently rather limited. The Wicken project offers major opportunities to enhance the current provision by the creation of cycle paths, footpaths, horse trails and circular routes from the city centre to the countryside. It can provide a positive link between city and countryside.

Whilst the urban areas of Cambridgeshire are flourishing, economic development in the rural areas is depressed as a result of the current state of farming. The new reserve has the possibility of providing additional jobs in the locality. There is also the possibility of additional economic activity locally resulting from visitors to the reserve.

Cultural and community involvement

For the new reserve to be successful and popular, it will need the full support of the local community and the business sector in Cambridge along with a large number of voluntary and statutory organisations. Communicating and consulting with these interests has been a key issue for the National Trust and as the project develops this will be integral to its progress. Media publicity both regionally and nationally has been given to the Project, which has helped to encourage the debate. If this ambitious project is to proceed, the National Trust will have to work in partnership with many different and diverse organisations and individuals. Development of partnerships forms the centre piece of the approach to implementing these ideas.

On the basis of the feasibility study, the National Trust began to discuss the project more widely and encourage support for the initiative. Following a series of meetings during 2000 the National Trust has approved the principle of implementing the 'Wicken Vision' and the project now forms part of the recently published National Strategic Plan. The Trust has sought views widely outside the organisation to determine the feasibility and desirability of the project. Over 270 presentations have been given and to date the reception has been overwhelmingly positive. The project has been widely discussed ensuring that the Trust has adopted a holistic approach to the initiative as opposed to viewing it simply as a nature conservation initiative.

Progress to date

The Trust has contacted all the landowners in the project area informing them of our ideas and we have met over 70 in person. There has been a considerable amount of media coverage both nationally and locally in magazines, newspapers, on the television and on the radio and this has helped considerably in generating interest in the project locally and nationally.

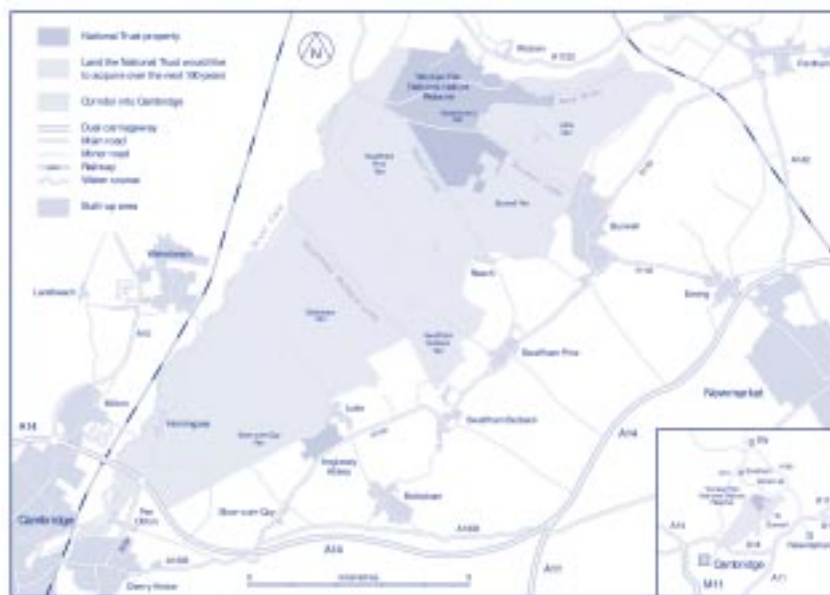
As a result of the media coverage the National Trust has been approached by a number of landowners who are willing to sell their land to assist with the project. The first area of land, Guinea Hall Farm, (115 acres) was acquired in October 2000. This lies immediately adjacent to the east of the existing reserve. This was funded entirely from resources within the National Trust, but it is anticipated that all subsequent purchases will have to involve partnership funding. A second purchase of 415 acres of Burwell Fen Farm was acquired in October 2001 for £1.7M including a grant of £933,500 from the Heritage Lottery Fund. The Trust is currently in negotiations with a number of landowners for a further 1250 acres of land.

The challenges of funding have been discussed with a number of potential partners. The Heritage Lottery Fund (HLF) in particular has been very positive about its potential future involvement. They describe Wicken Fen as an 'iconic' site and wish to partner the National Trust in making the Wicken Vision a 'beacon' project.

Further details of this project can be found on www.wicken.org.uk.

A longer version of this article will appear later in the year in 'Decolonising Nature' edited by W. Adams and to be published by Earthscan.

Adrian Colston is property Manager, Wicken Fen, The National Trust.



Map of Wicken Fen Vision © National Trust

Extinct Plant Rediscovered in Wales

Tim Rich, MIEEM

The Snowdonia Hawkweed (*Hieracium snowdoniense*), last seen nearly fifty years ago and considered extinct, has been rediscovered in its home in Snowdonia.

The Snowdonia Hawkweed always seems to have been a rare plant. Since it was first discovered in the 1880s, it has been recorded from seven mountain ledges in Snowdonia but it is found nowhere else in the world. It was last seen in 1953 in Cwm Idwal National Nature Reserve from the end of a rope and, despite a number of searches, had not been seen since. In July 2002, Scott Hand, Hywel Roberts and Janet Buckles of the Countryside Council for Wales, and Tim Rich of National Museums and Galleries of Wales, re-found one plant in full flower.

Using historical information published in the literature, details of specimens in the Welsh National Herbarium and other scientific collections, the history and distribution of the Snowdonia Hawkweed were pieced together two years ago. It was first discovered by the great Carnarvonshire botanist John Griffith in the 1880s whilst he was writing his Flora of Anglesey and Carnarvonshire (published in 1895), and was later made into a species in its own right by the hawkweed experts Peter Sell and Cyril West in 1955. It grows to about 30 cm tall, and has a cluster of beautiful golden-yellow flowering heads on a long stem with a rosette of leaves at the base. The backs of the flowers and their stalks are covered in distinctive black, glandular hairs. It looks similar to a number of other Hawkweeds which also occur in Cwm Idwal and elsewhere in Snowdonia. The locality information was used to target searches of the mountains in 2000 but, after several exhausting expeditions armed with binoculars, no plants were found and suspicions grew that the Snowdonia Hawkweed was indeed extinct. It pays, however, not to give up hope. On a final check last week (July 2002), to our great delight and relief, one plant was spotted on a low cliff near to where it was last seen. It had either been growing un-noticed for many years or had resurfaced from buried seed.

The main reason for its decline has probably been the huge increase in sheep grazing at high altitudes in the mountains over the last 50 years. Most hawkweeds are highly palatable to sheep, and it may simply have been eaten to extinction in the more accessible sites. The rediscovered plant on the cliff is safely out of reach of hungry sheep!

A recent management development at Cwm Idwal National Nature Reserve has been the removal of sheep grazing to benefit the wildlife. Already in the last two years the grasslands have become more flowery and colourful. It is hoped that this removal of grazing will also allow the Snowdonia Hawkweed to spread back into some of its former sites.

With only one individual known, the Snowdonia Hawkweed is one of the rarest plants in the world. It is much rarer than the famous Snowdon Lily, for which there are seven sites, some with hundreds of plants! An urgent priority will now be to collect seed of the Snowdonia Hawkweed and get it into cultivation at the National Botanic Garden of Wales, who are also collaborating with conservation of rare Welsh plants.

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Snowdonia Hawkweed in Cwm Idwal National Nature Reserve
(Courtesy of Scott Hand)

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 Jim Thompson,
 Joel Bateman
 and Nick Jackson



British Ecological Society

C. Menard, P. Duncan, G. Fleurance, J. Y. Georges & M. Lila.

Competitive foraging and nutrition of horses and cattle in European wetlands.

Journal of Applied Ecology 2002, **39**: 120-133.

As domestic horses and cattle are used more widely in Europe for the management of conservation areas, particularly wetlands, a good knowledge of their foraging behaviour and comparative nutrition is necessary. Horses are generalist herbivores that co-exist with cattle in many ecosystems. There are two main hypotheses to explain their co-existence:

- (i) differing functions of the animals' digestive tract (hindgut & ruminant),
- (ii) resource partitioning through a diet of different plant species.

This paper reports on different resource use by horses and cattle during complementary studies in two French wetlands. Horses used marshes intensively during the warmer seasons; both species used grasslands intensively throughout the year; cattle used forbs and shrubs more than horses. Niche breadth was similar and overlap was high. Horses spent much more time feeding on short grass than cattle. Comparative daily food intake was 63% higher in horses than in cattle. Digestibility of the cattle diets was a little higher, but daily intake of digestible dry matter was considerably higher all year round in horses than in cattle.

The authors conclude that horses are a good tool for plant management. Where the objective of the management is to control the development of the vegetation in marshes, the feeding strategy of horses means that this can be achieved with fewer horses and less management than with cattle. Where the objective of management is to restore a natural guild of grazers, cattle will require an ecological refuge for survival during winter, as horses will out compete cattle in habitats dominated by grasses. In the long term, grasslands in most wetlands are invaded by woody plants, cattle eat broad-leaved plants to a greater extent than horses, and so can reduce the rate of encroachment by certain woody species.

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S. Scadt, E. Revilla, T. Weigand, F. Knaurs, P. Kaczensky, U. Breitenmoser, L. Bufka, J. Eervený, P. Koubek, T. Huber, C. Staniva and L. Trepl.

Assessing the suitability of central European landscapes for the reintroduction of Eurasian lynx.

Journal of Applied Ecology 2002, **39**: 189-203.

The management and conservation of large carnivores, such as the Eurasian lynx (*Lynx lynx*) is particularly difficult due to their large requirements for space. Intensive human land use is responsible for habitat fragmentation, which results in conflicts with those carnivores that compete with humans for the remaining natural space and resources. Conservation strategies for such animals focus on their integration into multi-use landscapes inevitably dominated by humans. After an absence of almost 100 years, the lynx is slowly recovering in Germany along the German-Czech border. This study presents a habitat suitability model for lynx in Germany as a basis for further management and conservation efforts aimed at recolonisation and population development.

A statistical habitat model was developed using logistic regression to quantify the factors that describe lynx home ranges in a fragmented landscape. As no data was available for lynx distribution in Germany, data was used from the Swiss Jura Mountains for model development. This was then validated with telemetry data from the Czech Republic and Slovenia. Several variables were derived describing land use and fragmentation; variables were also introduced that described the connectivity of the forested and non-forested semi-natural areas on a larger scale than the map resolution.

A model was obtained with only one significant variable that described the connectivity of forested and non-forested areas on a scale of about 80km². This result was biologically meaningful, reflecting the absence of intensive human land use on the scale of an average female lynx home range. Model testing at a cut-off level of $P > 0.5$ correctly classified more than 80% of the Czech and Slovenian telemetry location data of resident lynx. Application of the model to Germany showed that the most suitable habitats for lynx were large forested low mountain ranges and the large forests in east Germany. This approach illustrates how information on habitat fragmentation on a large scale can be linked with local data to benefit lynx conservation in central Europe. Spatially explicit models like this can form the basis for further assessment of population viability of other species of conservation concern.

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S. Thirgood, S. Redpath, S. Campbell and A. Smith.

Do habitat characteristics influence predation on red grouse?

Journal of Applied Ecology 2002, **39**: 217-225.

Red grouse (*Lagopus lagopus scoticus*) are economically important gamebirds that are widely distributed in heather (*Calluna vulgaris*) moorlands of the UK. Grouse populations are maintained at high densities for sport shooting by habitat management and the control of parasites and predators. Predation is not only an important ecological process in the population dynamics of red grouse, but also has conservation implications for their predators, raptors such as the hen harrier (*Circus cyaneus*) and the peregrine falcon (*Falco peregrinus*). Grouse managers may kill these protected birds of prey as they believe that raptor predation reduces grouse shooting bags. This study examined whether habitat characteristics influenced predation on red grouse on a managed moor in southern Scotland. The authors combined demographic studies of the grouse population with radio telemetry of individual grouse to assess the influence of habitat on mortality rates. Systematic observations of hen harriers were also used to assess the effect of habitat characteristics on their encounter and strike rates with grouse and other prey.

There was no evidence to suggest that habitat characteristics directly influenced grouse mortality rates at the population scale. However, grouse densities were higher and overwinter losses of grouse were lower on areas with greater cover of heather. The most likely explanation for the observed pattern of winter loss was that grouse dispersed into areas with more heather, to some extent locally compensating for losses to predators. There was no effect of heather cover, vegetation height or vegetation density on the likelihood of individual grouse survival.

Hen harriers were more likely to encounter broods in a mixture of heather and grass than expected from the observed distribution of grouse broods on moorland. However, having encountered a grouse brood, habitat type or vegetation height had no effect on strike success of the harriers.

The paper concludes with some management implications. The authors suggest that to minimise conflicts between grouse management and raptor conservation the strategy should be to reduce the density of passerine and small mammal prey for harriers and therefore reduce harrier abundance and predation on grouse. Alternative approaches such as the provision of supplementary food to harriers or directly limiting harrier densities by either translocation or destruction of eggs, have been controversial with both grouse managers and conservationists.

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R. S. Smith, R. S. Shiel, D. Millward, P. Corkhill and R. A. Sanderson.

Soil seed banks and the effects of meadow management on vegetation change in a 10-year meadow field trial.

Journal of Applied Ecology 2002, **39**: 279-293.

Upland meadow grassland plant communities associated with traditional agricultural management regimes are rare examples of diverse plant communities found on the Pennine Dales in northern England. Enhancement of plant species diversity is often an objective in grassland management for wildlife conservation. Such management regimes may also change the species composition of soil seed banks, which may themselves affect future vegetation change.

Re-creation of diverse mesotrophic grassland from agriculturally improved swards is a conservation objective in the Pennine Dales Environmentally Sensitive Area, aimed at increasing the area of species rich grassland. Management prescriptions utilize knowledge gained by long-term experiments in the UK and continental Europe.

This paper compares the soil seed banks and vegetation from a long-term meadow management trial and from a series of traditionally managed species rich meadows in Northern England. The management trial used three hay cut date treatments through the summer, two fertiliser treatments of varying quantities of nitrogen, phosphates and potash and two seed treatments of no seed and seed of many species sown 1990 – 92. The soil seed banks were assessed in 1998. Subsequent vegetation development under these treatments, and the additional farmyard manure treatment, was assessed in 2000.

Most seeds were found in the first 5cm of soil and most of the frequent species germinated in the autumn. Short and long term persistent seed banks were most abundant. The species composition of the seed banks and the vegetation in the trial, and in the traditionally managed meadows used as a control, were distinctly different, the meadow trial seed bank being the most uniform.

In 2000, only the seed addition treatment increased the species richness of the vegetation. Farmland manure and mineral fertiliser had similar effects, increasing the cover of *Poa trivialis* and *Rumex acetosa* and decreasing the cover of *Rhinanthus minor* and *Anthoxanthum odoratum*.

It was concluded that the development of soil seed bank probably lags behind increases in vegetation diversity initiated by seed sowing. This emphasises the need to introduce additional species as seed when increased diversity is a target for the restoration management of previously intensive managed grassland.

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P. Fauchald, K. E. Erikstad and G. H. Systad.

Seabirds and marine oil incidents: is it possible to predict the spatial distribution of pelagic sea birds?

Journal of Applied Ecology 2002, **39**: 349-360.

Data on the spatial distribution of sea birds at sea is commonly used in risk assessment of the possible impact of oil spills. This paper discusses the year-to-year predictability of the spatial distribution of guillemots (*Uria spp*) and assesses the vulnerability of such populations to spatial disturbances (e.g. to oil spills). Authors' findings contradicted the general conclusion that seabirds are attracted to spatially predictable areas where oceanographic features enhance the general density of potential prey. This paper shows the necessity to disentangle the predictable (indicates areas of high vulnerability) and the unpredictable (the variability in number of individuals affected) parts of different spatial scales.

In accordance with the low spatial predictability revealed by correlation analysis, the parameter estimates from empirical models changed considerably from year to year. Although the models did on average better than a random model in predicting the distribution in other years, the predictability pattern varies considerably depending on the year used in the estimate. Furthermore no relationship was found, between the fit of the models and the ability to predict other years.

Even if the spatial distribution of guillemots in one year could be fairly well described by the environment variables, this did not imply that the model had a high predictive power regarding other years. This result illustrates a serious problem associated with using environmental variables in predicting the spatial distribution of wildlife.

Thus although we expect sea birds to be associated with specific oceanographic habitats this technique is strictly only a method of interpolation within one single year and indicates nothing about causal relationship between guillemots and oceanographic features.

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P. S. Hammond, P. Berggren, H. Benke, D. L. Borchers, A. Collet, M. P. Heide-Jorgensen, S. Heimlich, A. R. Hiby, M. F. Leopold and N. Oien.

Abundance of harbour porpoise and other cetaceans in the North Sea and adjacent waters.

Journal of Applied Ecology 2002, **39**: 361-376.

The status of small cetaceans particularly harbour porpoise (*Phocoena phocoena*) in the North Sea and adjacent waters has been of concern for many years.

This concern has stemmed from substantial incidental catches in fishing operations, declines in the number of stranding record, sightings in coastal waters, from the possible risk of contaminants and disturbance.

This paper deals with the relevant need for basic information on the biology of *P. phocoena* and other small cetaceans, including their current abundance.

These studies in the past have only covered parts of the North Sea and adjacent waters and in all cases the methodologies limit the inferences possible from the data. In particular, where line transects sampling was conducted the standard assumption was that all animals on the transect line were detected. This is unlikely for cetaceans in general and certainly not for *P. phocoena*.

The need for accurate and precise estimates of abundance of *P. phocoena* and other small cetaceans throughout the North Sea and adjacent waters has been recognised by many organisations and conventions including the UN Convention on the conservation of Migratory Species (Bonn Convention). Project Scans (Small cetaceans abundance in the North Seas) was initiated in 1993 to fulfil this need. The objectives were to identify concentrations of *P. phocoena* and other small cetaceans in this area and to estimate their abundance in order to provide essential information for conservation, management and future monitoring.

The project involved intensive shipboard and aerial survey using line transect sampling. *P. phocoena* are difficult to survey because of their small size and undemonstrative behaviour at the surface. In addition the aim of obtaining accurate estimates of abundance dictated that important potential sources of bias in methodology needed to be addressed. The shipboard surveys covered 20,000 km in an area of 890,000 km². Aerial transects covered 7000km in an area of 150,000km².

Three species dominated the data: Harbour porpoise *Phocoena phocoena* with 341, 366 individuals, White beaked dolphin *Lagenorhynchus albirostris* with 7856 individuals and minke whale *Balaenoptera acutorostrata* with 8445 individuals.

There now exist baseline estimates of abundance for the main species of cetacean in the North Sea and adjacent waters that will serve as a reference point for the future and upon which a framework for a management and monitoring programme can be founded.

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J.K. Pinnegar, S. Jennings, C.M. O'Brien, and N.V.C. Polunin.

Long-term changes in the trophic level of the Celtic Sea fish community and fish market price distribution.

Journal of Applied Ecology 2002, **39**: 377-390.

It is good to see a paper on this subject in the Journal of Applied Ecology as opposed to a Marine Sciences Journal. The issue is familiar: intensive fisheries exploitation with ensuing decline in fish stocks. The objectives of

the study were to a) describe changes in the mean trophic level of survey catches and fisheries landings using ^{15}N stable isotope derived estimates and b) examine whether changes are reflected in the relative market price distribution of the fish species. The isotope data were obtained from tissue samples collected in 2000 in the Celtic Sea. The survey, landings and price data together spanned the last 50 years. The analyses showed that there has been a significant decline in the mean trophic level of survey catches from 1982 (monitoring began '81) to 2000 and a decline in the trophic level of landings from 1946 to 1998. This was due to a reduction in the abundance of large piscivorous fishes and an increase in smaller pelagic species which feed at a lower trophic level. The decline was more marked from the survey data than from the landings data, suggesting that the changes in the underlying ecosystem may be stronger than any changes in fishery preferences for particular species. If invertebrates had been included in the analyses, then the trends may have been even more marked. There is little evidence that the trend is because the lower trophic level species have increased in number as a result of the demise of their predators. It is thought that climatic effects have considerably influenced the spawning and therefore the abundance of species. In addition to overexploitation, the decline of cod and haddock coincided with an increase since 1988 in sea temperature. Regarding the market, the authors found for the Celtic Sea study, that scarcity of the higher trophic level species drove up their price, relative to the lower trophic species. They speculate that in heavily fished areas species abundance and their market price will eventually become uncoupled. Globally, fisheries will typically target species at high trophic levels. Although decreased abundance of high trophic level species will ultimately have negative economic consequences, the reduction in mean trophic level of the fish community as a whole may allow the system to sustain higher fishery yields. The authors conclude that Management objectives in this fishery will depend on the relative values that society attaches to economic profit and protein production.

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A.J.P. Smolders, H.B.M. Tomassen, L.P.M. Lamers, B.P. Lomans, and J.G.M. Roelofs.

Peat bog restoration by floating raft formation: the effects of groundwater and peat quality.

Journal of Applied Ecology 2002, **39**: 391-401.

Apart from being unique ecosystems supporting specific plant and animal communities, peat bogs may have a potential influence on global carbon cycling as sinks or sources of carbon. A prerequisite for the restoration of desiccated bog remnants is rewetting the peat surface. Frequently in Europe, extensive areas are flooded in order to maximize water retention, and growth of peat mosses is often observed in the shallow zones. In deeper waters, regeneration appears to depend on whether residual peat will become buoyant and form floating rafts. In glasshouse experiments, the authors looked at the conditions determining buoyancy of peat monoliths cut from three cut-over bog remnants in the Netherlands.

The conclusions were that when bog remnants are inundated the prospects for bog regeneration are largely determined by peat quality and water chemistry, i.e. peat mats with low concentration of lignin and phenolics and low C:N ratios are most likely to become buoyant in water with a higher pH, and so provide suitable environments for *Sphagnum* species. The mechanism is that when groundwater containing bicarbonate ($1\text{ mmol l}^{-1}\text{ HC}^{-}$), at pH 6.0) is applied, the pH of peat monoliths increased from c. 3.5 to c. 4.5 due to acid buffering. As a result, two of the peat types became more buoyant due to the increase in concentration, production and emissions of methane (CH_4). The high lignin peat is less decomposable and the treatments did not influence buoyancy. When groundwater contained both HCO_3^- (1 mmol l^{-1}) and sulphate (1 mmol l^{-1}), the pH was further increased from 4.5 to approximately pH 5.0 due to alkalinity generated by the SO_4^{2-} reduction process. CH_4 production, however, decreased because of interference from the SO_4^{2-} . Phosphate concentrations, however, greatly increased in the HCO_3^-

$^{4/}\text{SO}_4^{2-}$ addition treatment due to the interaction between sulphide and iron phosphate precipitates. When peat quality is inadequate, either shallow inundation or the addition of suitable peat from elsewhere is required.

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C.H. Keiffer, and I.A. Ungar.

Germination and establishment of halophytes on brine-affected soils.

Journal of Applied Ecology 2002, **39**: 402 - 415.

Although this study was aimed specifically at oil-production areas and contamination of soils with oilfield brines the authors suggest that this method may be valuable in other areas of soil salinization such as from road run-off and from irrigation schemes. The study tested the feasibility of using different salt-accumulating halophyte species to remediate brine-contaminated soils at a site in south-eastern Ohio, USA. Species used were *Atriplex prostrata*, *Hordeum jubatum*, *Salicornia europaea*, *Spergularia marina* and *Suaeda calceoliformis*. The results indicate that establishment of salt-accumulating halophytes on salt-affected sites can sufficiently remediate the soil to the point where it can be returned to agricultural productivity or where native plants can invade and become established. Autumn sowings were more successful at establishing. With the exception of *S. europaea*, all species reduced soil salinity significantly compared with paired control plots, ranging from 4% in the grass *H. jubatum* to 17% in *A. prostrata*. Interestingly, leaching alone following precipitation resulted in a 44% reduction in Na^+ from control plots over a 4-year period, compared with a 59% reduction in Na^+ from plots vegetated with halophytes over the same period. The phytoremediation process can be facilitated by tailoring plant selection to site conditions, using inputs of fertilizer and water to enhance the growth of the halophytes, and by harvesting the plants on a regular basis. The grass *H. jubatum* had significantly more Na^+ in its roots than in its shoots, making it less suitable for site remediation than *A. prostrata* or *S. calceoliformis*. Overall, these results are encouraging only for areas of the world where the contamination source has been removed, such as at former oilfield sites, and where there are reasonable levels of precipitation. The authors, however, refer to promising studies in arid areas where the halophytes can be irrigated with reused saline drainage water.

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D. Moorcroft, M.J. Whittingham, R.B. Bradbury, and J.D. Wilson.

The selection of stubble fields by wintering granivorous birds reflects vegetation cover and food abundance.

Journal of Applied Ecology 2002, **39**: 535 - 547.

In recent decades the populations of many farmland taxa have declined, including plants, invertebrates, mammals and birds. In the latter case, fields left fallow after harvest (i.e. stubble fields) support high wintering densities of many species of granivorous bird. The authors examined correlates of use by eight such species of different types of intensively managed wheat and barley stubble fields, organic wheat fields and set-aside fields on mixed lowland farmland in central England. Field occupancy was studied in relation to the physical characteristics of fields and seed abundance. Higher seed abundance was associated with greater occupancy by linnet *Carduelis cannabina*, grey partridge *Perdix perdix*, chaffinch *Fringilla coelebs*, yellowhammer *Emberiza citrinella*, reed bunting *Emberiza schoeniclus* and corn bunting *Miliaria calandra*. Larger areas of bare earth within stubble fields were associated with greater occupancy by linnet, yellowhammer, reed bunting and corn bunting, but lower occupancy by woodpigeon *Columba palumbus*.

On conventional intensively farmed sites, seed abundance and area of bare earth were significantly greater on barley stubbles than on wheat stubbles. Overall, the authors recommend that land managers who wish to maximize the value of overwinter stubble fields for granivorous birds locate such fields where there is a substantial natural regeneration of weed flora and where previous cropping (e.g. barley) is likely to offer a sparse stubble with substantial areas of bare ground.

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L. Kullman.

Rapid recent range-margin rise of tree and shrub species in the Swedish Scandes.

Journal of Ecology 2002, **90**: 68 - 77.

The general consensus appears to be that the effects of climate change are likely to be most keenly felt in variations in the margins of various types of vegetation. The paper deals with a site in central Sweden where recent elevational range-margin performance of tree and shrub species was studied. The methods included comparisons of historical and present-day range-margin records in conjunction with age-determination of newly established saplings.

Since the early 1950s, the range-margins of *Betula pubescens ssp. tortuosa* (mountain birch), *Picea abies* (Norway spruce), *Pinus sylvestris* (Scots pine), *Sorbus aucuparia* (rowan) and *Salix* spp. (willows) have advanced by 120-375m to colonize moderate snow-bed communities. The non-native *Acer platanoides* (Norway maple) has become established just below the birch forest-limit. There was also a tree-limit rise of 100-150 m in the same region. Ring-counting (in 2000) of a subsample of the recovered saplings revealed that, with one exception, they were aged between 7 and 12 years, i.e. they germinated after 1987. Since 1988 there has been strong and consistent winter warming, with some very warm summers, and this may have produced the vegetational changes.

Reduced summer snow-retention favoured seedling establishment and juvenile growth, and mild winters, with reduced risk of frost-desiccation, enhanced survivorship and height increment. There is interesting reference in the paper to the implications for trees in Scotland.

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R. Motta, P. Nola and P. Piussi.

Long-term investigations in a strict forest reserve in the eastern Italian Alps: spatio-temporal origin and development in two multi-layered subalpine stands

Journal of Ecology 2002, **90**: 495 - 507.

There is some interest in mainland Europe in the idea of vegetation development in the absence of man and part of the forest reserve established in Paneveggio Forest (Trento, Italy) in 1992 has been allowed to evolve without human intervention. Inside this reserve, two 1-ha long-term monitoring plots were established in subalpine multi-layered forest stands.

To investigate the origin, spatio-temporal development and disturbance history of these plots, the present study combined dendroecological tree ring analysis with historical evidence.

One stand (VB3) had an uneven-aged population in which the oldest trees were more than 400 years old. Regeneration has been continuous both in time and space over the last three centuries, during which time the stand has been affected regularly by disturbances. This supports the information from historical documents, suggesting that a selection system was carried out in this area.

The second stand (BDO) also had an uneven-aged population, with trees up to 397 years old. Although this plot too had been affected quite regularly by disturbances, massive regeneration occurred only after 1920, suggesting that the land might previously have been exploited as pasture.

Despite their relatively similar structures, the two plots developed in entirely different ways. The study confirmed that biological data can be used to identify the occurrence and intensity of prior localized disturbances in forest stands, but the precise causes of the disturbances can be determined only by comparing biological data and historical records.

This paper mirrors the kind of work undertaken by O'Rackham on the history of areas such as Chalkney Wood and no doubt there are many places where the historical records could be investigated to advantage

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E.A.D. Mitchell, A. Buttler, P. Grosvernier, H. Rydin, A. Siegenthaler and J-M. Gobat.

Contrasted effects of increased N and CO² supply on two keystone species in peatland restoration and implications for global change

Journal of Ecology 2002, **90**: 529 - 533.

Significant areas of temperate bogs have been damaged by peat harvesting but may regenerate. These secondary mires, if well managed, may act as strong C sinks, regulate hydrology and buffer regional climate.

The potential effects of bog regeneration will, however, depend on the successful establishment of the principal peat formers -Sphagnum mosses. The influence of hydrology and microclimate on Sphagnum re-growth is well studied but effects of elevated CO² and N deposition are not known.

Two in-situ experiments were carried out in a cutover bog during three growing seasons in which they raised either CO² (to 560 p.p.m.) or N (by adding NH₄NO₃, 3 g m² year⁻¹). The two treatments had contrasting effects on competition between the initial coloniser *Polytrichum strictum* (favoured by high N) and the later coloniser *Sphagnum fallax* (favoured by high CO²). Such changes may have important consequences for bog regeneration and hence for carbon sequestration in cutover bogs, with potential feedback on regional hydrological and climatic processes.

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S.J. Richardson, M.C. Press, A.N. Parsons and S.E. Hartley.

How do nutrients and warming impact on plant communities and their insect herbivores? A 9-year study from a sub-Arctic heath

Journal of Ecology 2002, **90**: 544 - 556.

Responses of a Scandinavian sub-Arctic dwarf shrub heath community to 9 years of nutrient and temperature treatments were examined. The objective was to assess the responses of plant and insect herbivore communities to these treatments, and to determine how vegetation responses scale-up to those of a second trophic group.

There were strong effects of nutrient addition on the above-ground biomass of both dominant (dwarf shrubs) and subordinate (grasses and mosses) plant functional groups, with responses by the latter being of greater magnitude. Responses to temperature were less frequent and of a smaller magnitude.

There were marked changes in the abundance of insect herbivores in response to the treatments. Changes in the above-ground biomass of subordinate plant species had a greater impact on the composition of the insect herbivore community than the smaller responses of dominant dwarf shrubs. For example, the abundance of a moss-feeding Heteropteran in fertilized plots was as little as 6 that of controls, while Homoptera specializing on grasses were over 400 more abundant. In addition, gramnivorous taxa (the Delphacidae) were present only in those plots that received nutrients. Despite some species-specific effects of the perturbations on the quality of dwarf shrub annual shoots (defined as the concentrations of nitrogen and phenolic compounds), little change in leaf herbivory was observed. Insect herbivores removed less than 1 of annual biomass from dominant dwarf shrub species.

It is proposed that insect community change was driven by subordinate plant groups and not by the dominant dwarf shrub species, suggesting a wider importance of subordinate species for community structure.

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The Hanson - RSPB Wetland Project

Jeff Kew MIEEM and Andy Roberts

Introduction

The planned development of a new nature reserve incorporating the largest freshwater reedbed in the UK is an ambitious habitat restoration project that is the result of a partnership between Hanson Aggregates and the RSPB. The reedbed wetland reserve will be constructed in phases over the next 30 years at Hanson Aggregates new sand and gravel "super quarry" at Needingworth in Cambridgeshire. The project has benefited from the close involvement of the Minerals Planning Authority, Cambridgeshire County Council, which performed the dual role of facilitator as well as regulator during the planning process. The development of the project has necessitated the satisfactory resolution of a large number of technical and planning issues that have influenced the final design of the new wetland. The project has received a Royal Town Planning Institute National Award For Planning Achievement (2000) for planning and biodiversity, and has been nominated for the 2002 European Planning Awards.

Planning History

Policy Framework – The Cambridgeshire Aggregates Local Plan (1989)

In the late 1980's Cambridgeshire County Council revised its sand and gravel extraction strategy through a revision of its Minerals Local Plan. This entailed the concentration of production on three large sites in open Fenland – Needingworth, Block Fen (Mepal) and Eye/Thorney (Nr Peterborough).

The Cambridgeshire Aggregates Local Plan (1989) set the policy framework for restoration and while policy presumption for restoration to agricultural or forestry remains on high grade agricultural land, restoration for nature conservation can be considered on lower grade land where the community benefit is greater than that derived from other after-uses.

Proposed Development by Hanson Aggregates

Hanson Aggregates (formerly ARC) secured interests on the majority of land in the Needingworth (Willingham-Over) area of search in the late 1980s. This new mineral reserve provided the opportunity to replace three local Hanson operated quarries producing circa 1 million tonnes of aggregates with one new quarry capable of a similar level of production. In the subsequent pre-application discussions Cambridgeshire County

Council (Minerals Planning Authority) indicated that they would be minded to consider the unusual step of consenting all the land in the area of search. This was a recognition of the scale of investment that would be required by the operator in terms of infrastructure to develop the new reserves which involved contributing to a new bypass, and construction of a new river crossing, site access, and processing plant.

Proposed Development and the Potential for Nature Conservation Restoration

The Planning Application was submitted in 1993 with the majority of the area (516 ha) to be restored to agricultural use at existing and low level. The restoration scheme was prepared in the belief that the agricultural land was mostly in the high-grade categories of 3A and 2.

During the formal consultation, soil tests carried out by ADAS on behalf of MAFF revealed the majority of land on Over Fen to be grade 3B, falling outside the policy protection given to Best and Most Versatile Land (Grades 1,2 and 3A). This triggered the nature conservation interests including the RSPB to work together to produce an alternative restoration proposal. The nature conservation interests recognised there was no longer a policy presumption for agricultural restoration, and the potential to produce a nature conservation site of at least national importance. The site was deemed to have a particular strategic location adjacent to the internationally important Ouse Washes (SPA, part c. SAC, Ramsar, and SSSI) and therefore serious consideration should therefore be given to a nature conservation after-use. The nature conservation bodies suggested that the site was suitable for the development of a large wetland nature reserve capable of supporting populations of at least national importance for wildlife.

Cambridgeshire County Council decided to determine the original application as it was consistent with policy to restore sites to a beneficial after-use, in this case agriculture, but a proviso was included in the S106 agreement that Hanson Aggregates should produce a feasibility study to further examine the nature conservation restoration idea.

Nature Conservation Restoration Feasibility Study

The study was started in 1996 with RSPB representing the Nature Conservation interests. A combination of species and habitat priorities, arising from Biodiversity Action Plans, and the need to integrate a high degree of public access lent itself to the development of large wetland complex containing a high proportion of reedbed. The feasibility study concluded that subject to water availability a reedbed wetland could be developed and that the original low-level restoration concept at Over Fen should be retained in a modified form to maximize the area of that habitat



relative to open water. To achieve the low level restoration a 10km length of low permeability clay perimeter seal would be needed. Cambridgeshire County Council organised a public consultation exercise, including public meetings, to consider the idea of wetland restoration as an alternative to agricultural restoration. This consultation resulted in an 84% public approval rating for the new concept. Hanson Aggregates subsequently announced that they would progress the alternative restoration scheme with the RSPB as partners. A new planning application was subsequently prepared and submitted in June 1999 to quarry 27.8 million tonnes of sand and gravel and create a 700ha wetland nature reserve.

Key Planning Issues

Some of the key planning issues that needed to be addressed were flight safeguard zones (MOD), restoration and sustainability of the agricultural land (MAFF), water availability and flood bank stability (EA) and the views of the local communities. The proposed wetland lies within the flight safeguard zone of RAF Wyton and it was necessary to demonstrate that the wetland would be no greater risk, in terms of birdstrike, than the approved agricultural restoration scheme. The continued protection of the soil resource of both the 3B and relatively small area of grade 2 was an issue for MAFF. It was agreed to restore a 70cm layer of soils across the main bulk of the reedbed and exclude the 34 Ha of Grade 2 land from the reedbed scheme. This would retain the long-term option of a return to agricultural use if necessary. Local communities continued to be supportive throughout the planning consultations although reassurances needed to be provided on a range of issues ranging from increases in road traffic due to visitors to malarial risk from mosquitoes.

Development of the Nature Reserve

The nature reserve will be created in phases over the next 30 years and represents a very ambitious habitat creation project, and a major partnership between Hanson Aggregates and the RSPB to develop and implement the project. Indeed this will become one of the largest manmade wetlands in Europe. The rationale for creating the new reserve is based on restoring habitats that are in serious decline. The proposed restoration will create a wetland of at least national importance supporting a characteristic range of reedbed and wetland species. Locally over 95% of original reedbed area has been lost from the Fens. Many of Britain's remaining reedbeds are sited near to the East Anglian coast and are threatened by coastal erosion that will be accelerated by anticipated sea level rise and increased storminess. By establishing this reedbed, it will provide one of the largest non-tidal reedbeds in the UK in a location safe from coastal erosion and future sea level rise. The proximity of the site to the Ouse Washes, (one of the largest examples of internationally important washland and lowland wet grassland in Britain and designated status SSSI, Ramsar site, SPA site and part c.SAC site) could complement their management through a beneficial reduction in summer flooding. This would potentially enhance the success of the nationally important assemblages of waders and waterfowl, which breed on the Ouse Washes. Other benefits of the close proximity to the Ouse Washes include additional nesting and roost sites for wildfowl and additional hunting areas on the washes for marsh harriers.

The establishment of an extensive area of lowland wet grassland was originally considered as an option for the restoration of the site. This could have provided an important area for breeding waders, including black-tailed godwit and wintering waterfowl. However, the key bird species associated with this open habitat are much more prone to disturbance than those of reedbeds and less compatible with the scale of public access and informal recreation which was deemed desirable in this location. Reduced levels of public access would have been unlikely to satisfy the important planning consideration of providing a higher level of community benefits than the agricultural scheme. Reedbed species are better able to withstand disturbance due to the dense nature of the reedbed habitat. Therefore on this site reedbed would provide the greatest

contribution toward meeting the Governments BAP targets, by supporting many species of conservation priority and concern and providing more extensive informal public access.

The objectives for the new nature reserve are:

- To establish a wetland of at least national importance that makes a substantial contribution to UK Biodiversity Action Plan targets for reedbeds and bitterns and support the characteristic assemblages of plants and animals that were once widespread in the Fens.
- To contribute to the alleviation of Ouse Washes Summer Flooding.
- To enhance the landscape through wetland creation and management.
- To provide informal recreational opportunities for the benefit of local communities and visitors.
- To provide an educational resource which will foster wider interest in, and support for, biodiversity and conservation.
- To provide a best practice example of beneficial conservation after-use following large-scale mineral extraction.

The new wetland will contain 460ha of reedbed created in 20-40 ha. banded cells serviced by a high-level water carrier. Each cell will contain small meres linked together with ditches and channels. High water quality will be maintained and with it a self sustaining fish population. The reeds will be managed by periodic cutting with some cattle grazing into the edges of the reedbeds. The new nature reserve will incorporate 32 km of dedicated public Rights of Way, including bridle and cycle ways. The new nature reserve will be managed by the RSPB and eventually will be known as Ouse Fen.

Water Requirements and Abstraction

The new reserve will be created in the driest region in the country with the main wetland area created at low level and isolated from the surrounding water table. Careful assessment of water requirements were made based on MOREX data to accurately predict evapo-transpiration rates with adjustments for climate change predictions. This led to the application for an abstraction licence for annual winter abstraction of up to three million m³. Thorough environmental assessment was undertaken together with an appropriate assessment in accordance with the Habitats Regulations, given the proximity of the Ouse Washes SPA.

The new wetland has been designed to receive water during flood flow conditions with a high intake rate of 5 m³/second and be capable of withstanding future drought. Examination of Great Ouse daily flow data revealed the probability of a one in twenty year inability to abstract water, due to low winter flows. Modifications were made to the design to enable deeper storage of water within the reedbed areas with a target winter water level of 0.6m. The design includes the capability to pump out water into the adjacent IDB system and to recirculate water in mid-summer to reduce the risk of eutrophication.

Next Steps

The project is now moving from the planning stage, with consents having now been obtained together with a £1 Million contribution from the Hanson Environment Fund to support the RSPB's long-term management. The first phase of wetland restoration will commence in 2002/03 with further phases added on an annual or bi-annual basis. The site is being progressively opened to local people through the development of the public rights of way network. Development of promoted visitor facilities is scheduled from 2007. There is the prospect of a rapidly increasing population of breeding bitterns from 2010.

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These letters from members of the teaching profession continue on from last issue's comments about the quality of graduates' taxonomic skills, along with their competence to work in the ecological and environmental management sectors.

The problem is even more serious than is perhaps evident from the letters from your correspondents. Universities are under severe economic pressure and under the present regime they can only increase their unit funding per student by achieving an international status in a Research Assessment Exercise (RAE). The RAE is based on a variety of measures such as publication record and research contract income. Under a strong guidance from the Government the research councils are selecting particularly to fund research that relates to molecular genetics; even the NERC shows this trend as a review of the grants allocated by them will demonstrate.

I well remember putting a research application to the NERC that received what I can only regard (modestly!) as rave reviews from several internationally respected referees such that I felt quite confident that I would be successful (if Prof. X says that how can they not fund it?). I was not successful and a review of the successful grant applications showed that a number of "so what" molecular genetics projects had been accepted. This bias has become well known to the point where researchers put molecular genetics into their applications whether they are needed or not on the basis that this will help the chances of success!

This in turn has resulted in Universities appointing staff who are able to show a successful research income derived from a molecular genetics research programme (for the RAE). Biological Science Departments are then finding difficulty in servicing the student needs for a balanced curriculum. I know of one University where when the last plant ecologist retired they were not replaced but the entomologist was tasked with this element of the curriculum on the basis that as insects ate plants an entomologist would know their plants as well!

The problem becomes worse when it is appreciated that the RAE has pushed the appreciation of student needs so far towards the research element that, when I questioned staff at one University as to what were the expected student employment opportunities that their courses would produce, the unanimous response was that they were training researchers. When I replied that only perhaps a maximum of 20% might expect to follow this path so what would happen to the others the reply was, well the research skills will be useful anyway. There is some truth in this latter position but not to the exclusion of more useful and practical skills. Anyone prepared to offer university students the prospect of a field ecology based project will know that they are overwhelmed with applicants as there are so few opportunities for this type of study. There is indeed a serious disengagement of interests between the University provision and student need.

Two other levels of education are structurally in difficulty over providing the "naturalist" background to ecological employability. At school level the National Curriculum and the skills base of teachers plus the time constraints on teachers mean that pupils are not getting any significant exposure to the real natural world. My own botanical understanding and natural history background to my ecological practice was derived from buying my own copy of the Excursion Flora by Clapham, Tutin and Warburg and going for walks where I would not pass by a plant that I could not identify. If I found a new plant I would pick it (horrors!) take it home and work it out from the key. I still cannot pass an unknown plant by without getting its "jizz" and looking it up on returning home!

At post-graduate level many Universities use MScs as a way of marketing their research programme bearing in mind that the senior research

Universities have already signed up to a molecular genetics research programme. There are a number of courses that purport to train the ecologist for the professional role but as one of your correspondents points out this is sometimes not quite as successful as might be expected and where are the staff to teach these courses to come from?

I therefore contend that the problem is far more systemic than simply that Universities are not teaching taxonomic skills and "natural history" but that they are being pushed by Government policy bias away from such an educational provision. Other subjects have also been affected by this process: protozoology is almost invisible as a subject in British Universities where once the UK was the world leader, mycology is rapidly going the same way (although the molecular genetics elements of these two subjects are funded reasonably). In the case of Mycology I know of one University where five mycologists staffed a department of international repute and it now has no mycologists at all.

Therefore it seems that until it becomes national political policy to develop an educational and research programme that engenders the skills necessary in the practising ecologist the current trend by Universities to produce unemployable "ecologists" will continue. Is there a lobbying role for IEEEM here?

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Whilst recently visiting friends I came across a copy of your journal, issue No. 36 June 2002. Reading the articles on page 17 has made me so angry as to promote a response. Both myself and my husband have ecological degrees, and have worked in the industry. We both, it would be fair to say have exceptional identificational skills in both English and Latin I might add, and have done this by initially being encouraged to do so by our university courses. I went to Coventry University and did a BSc(HONS) in Geography with one years industrial placement at Westonbirt Arboretum, where I was fortunate enough to learn extensive plant ID from some truly informed experts. My husband had worked from the age of 15 in a nursery and then did Countryside Management at the University of Plymouth. His plant ID is second to none.

Good survey and ID skills are not things that can be taught in a three year university course, but are skills that develop over time. Perhaps Christopher Betts, instead of laying the blame at the door of the students themselves, should consider the intense pressure that students are under in terms of the financial costs that they face. Gone are the days of tripping off to the countryside at the weekends to practise plant ID, or spending the whole summer in Glen Coe doing survey work, gone in favour of weekends and holidays doing menial jobs just to pay the tuition fees!

As for the comment about abysmal state education, has he not looked at the statistics of the ever rising GCSE results, teachers working ever harder. I would challenge him on any day to come and witness the bright enthusiastic minds in my state education geography GCSE class.

The poor wages and increasing amount of voluntary experience required for jobs all adds to the financial problems facing the next generation of ecologists coming out of our universities, so in writing this email I ask the likes of Christopher Betts to not seek to blame, but to solve and look for solutions. Surely it is up to organisations like the I.E.E.M. to help.

Louise Davis

Teaching Survey Skills

The development of taxonomic and field survey and identification skills is an important issue but one that universities can only go so far in addressing. Whilst knowledge of the taxonomic systems can be taught relatively easily within the curriculum developing identification skills is a much longer process and so is very hard to fit in. Unless teaching these skills is to take up a large proportion of the student contact time it is not possible to devote sufficient time to this subject for students to acquire a great depth of knowledge. Units specifically on taxonomy/identification/survey techniques account for approx. 15% of contact time on our course (with reinforcement in other units as appropriate) but students still need to develop these skills further if they are to bring them up to the desired level for employment. In a general course aiming at preparing people for a range of posts in nature conservation management, universities like my own cannot increase this proportion without losing other important topics. Many students do not see themselves becoming field workers and so do not wish to spend a lot of time learning identification skills. Given the competitiveness of the market for students we cannot ignore this.

The problem of teaching field skills is exacerbated by the background and interests of students entering the ecological courses. While you might expect that students attending a course on nature conservation management would have a real interest in the subject this is not always the case. Some students arrive showing limited interest in, or knowledge of, the UK flora and fauna. Thus, we need to start teaching from a very low base on this topic.

As an additional practical difficulty, teaching runs from October through to May. This is clearly not the best time for novice field surveyors.

There is also an issue of the extent to which identification is an 'academic' subject. It is an essential tool for applying more academic skills (survey and analysis) but does not itself require what are regarded as more advanced academic skills (such as critical analysis, synthesis etc.). This has implications for the level at which it can be taught in a BSc course.

I believe that a university course should lay the foundation for developing field and identification skills. Students should be taught the basics of taxonomy, techniques for identification and have opportunities to apply these techniques in a range of habitat types. It is then up to those students who wish to work in jobs requiring these skills to develop them further. There is therefore a need for more advanced courses that students, and professionals starting their careers, could attend to further develop their skills. This is where IEEM has a role. The current one day courses in the PDP should remain and longer, more formal courses be introduced. IEEM should accredit courses where the content and the tutor's experience are appropriate.

On a related issue I feel that IEEM should consider doing more to raise the profile of consultancy as a career to students. This is probably the healthiest sector of the job market at present but not one that students seem to consider working towards. Very few of the applicants to the course that I speak to are aware of this option and few if any consider consultancies for their work placement. Often the student's image of a consultant is somewhat negative until they understand the role of consultants. Perhaps a greater awareness would give them more incentive to develop the necessary skills.

Dr J. C. Rose, MIEEM

Centre for Environmental Conservation and Outdoor Leisure, Sheffield Hallam University

Institute News

The Society for the Environment (SocEnv)

It's happened at last! After more than two years of negotiation, the Society for the Environment will be officially launched at the Environment UK 2002 Conference at Stoneleigh on 23rd October. The ten Institutions and a learned society involved have now all agreed to form a new umbrella organisation following wide-ranging discussions about the need for an authoritative environment sector body to co-ordinate views and, where possible, speak with one voice on cross cutting issues and to regulate standards of professional environmental practice. The statement of intent was published in *In Practice* some time ago, the goals of which are to raise the status and profile of the environment profession while maintaining the identity of the constituent bodies. One of the key objectives and first tasks of the SocEnv will be to submit a petition for a Royal Charter and to establish a new qualification of Chartered Environmentalist. Preliminary discussions with the Privy Council have already taken place on this matter. From the IEEM viewpoint this is a very satisfactory outcome and it does not preclude us going for a separate charter at some later date should we wish. The Institute is very grateful to Alex Tait, Vice President, for his work in attending the numerous meetings, which have taken place over the last three years and for his persistence in seeing this through to what promises to be a very successful outcome. There will be a further report on this issue in the next edition following the official launch.

External Relations Officer

The Institute is pleased to report that Mr Joel Bateman has been appointed to the recently advertised post of External Relations Officer. Joel joined IEEM in February as Trainee Executive Officer. As holder of this new post he will play an essential part in raising the profile of the Institute, co-ordinating the responses of the Institute to external consultations and servicing the newly operational External Affairs Committee – congratulations!

The Newcastle Meeting

Arrangements are now falling into place for the Newcastle Meeting and the programme will be distributed shortly. Dr David Goode has kindly agreed to give the Fellows lecture and the local northeast section are arranging some interesting site visits for the first afternoon of the Conference and some evening entertainment!

Patrons

The Institute is delighted and honoured to announce that Professor David Bellamy, President of the Wildlife Trusts and well known broadcaster and Sir Martin Doughty, the new Chairman of English Nature have kindly agreed to become Patrons.

The IEEM Constitution

Following on from the last *In Practice* the proposed changes in the Constitution have now been submitted to the Charities Commission and a response is expected shortly.

IEEM Staff Changes

IEEM is pleased to welcome Mr Nick Jackson as Trainee Operations Officer. Nick graduated from Plymouth University with honours in Ecology. Nick has been involved in database work, dealing with membership issues and generally helping with administration throughout the summer. The staff are currently Jim Thompson, Anna Thompson, Joel Bateman and Nick Jackson.

External Affairs

Following the meeting of the Committee on the 26th June, a response has now been made to the Department of the Environment, Food and Rural Affairs

on the Woodland Grant Scheme and Woodland Premium Scheme. This was a trial and is the first response by the Institute for some good time.

The Institute hopes to make its next response on *The future development of air transport in the United Kingdom* - issues surrounding the siting or expansion of future airports including the controversial proposal for the Kent Marshes at Cliffe.

IEEM Directory

Progress is being made on the on line Directory which it has been agreed should have 3 aspects - a commercial one where members offering services could display their areas of expertise with suitable contact details. This would have a search facility based on certain key words. The second section would be available to anyone visiting the site and would simply be a list of members without contact details. The third would be available only to members and would include names and contact details of all members to facilitate networking within the Institute but protecting those members who may not wish to be contacted from external sources.

Professional Development Programme

The programme for this year has proved to be the most successful yet with over 400 people having so far enrolled - the largest number so far. The secretariat is still very much open to suggestions from members wishing to offer courses for next year.

Obituaries

The Institute regrets to report the recent deaths from illness of two members: Dr David Balbi, MIEEM Research Assistant at the University of Durham and Ms Christine Bradley, MIEEM, Development Manager of the National Urban Forestry Unit. Also Mrs D.L. Baines who had carried out voluntary work in the office on many occasions.

Continuing Professional Development - CPD

The membership renewal forms have now been sent out and **all members are reminded that they should also return their CPD forms with the completed forms.** A 10% sample will then be analysed. A number of members have expressed concern that they may not have been able to complete the requirements – on the whole these concerns are probably unfounded and, after all, 20 hours is not that difficult to achieve. Given that this was the first year that a more formal CPD requirement has been introduced, it can be anticipated that the Institute will be prepared to be somewhat flexible when reviewing the CPD returns.

IEEM Website

Have you visited the IEEM website recently? It is now kept up to date on a regular basis and more and more will be the means by which information about the Institute can be disseminated quickly and easily.

Membership Subscriptions

Membership renewals are due on the 1st October and all members are urged to respond as soon as possible. Although the vast majority of members do renew, a reminder or even final reminder is sometimes necessary and this is very wasteful for the resources of the Institute. It is worth noting that last week, the Membership Admissions Committee reviewed the cases of three former members who had applied to renew a substantial period after their membership had expired. In compliance with procedures previously agreed, the Committee decided that fresh applications were necessary. Do remember that the Abeyance procedure is there to help members wishing to take a career break and who intend to return to professional ecological work at some later date without the necessity of re-applying for membership.

IEEM Scottish Section

Attendance promises to be good for the forthcoming Conference of the Scottish Section to be held in Aviemore on **Friday, 20th September**. The AGM will be held on that occasion and notices have been circulated to all members in Scotland. A report of the meeting will be published in the next In Practice.

Shadow Northeast Section

Apart from the launch as a Full Section at the Meeting in Newcastle the Northeast section has now set out its provisional programme for next year.

- **Jan 8th 2003** – Wild Woods - Can they be created? Hexham National Park Centre
- **Mar 12th** – Ecological Assessment Guidelines- the NE prospective (?)
- **May 14th** – Otterburn Training camp, what are the lessons learnt from the Public Enquiry?
- **Sept 10th** – ERDP/Agric Environment reform
- **Nov 12th** – AGM The role of the local Wildlife Trusts - what are they up to?
- **Jan 7th 2004** – The CRoW act two years on; where are we now?

For confirmation and further details please contact Steve Pullan or visit the IEEM website.

Recognition of IEEM Members

As Executive Director and *In Practice* Editor, I attend various functions, often for reporting purposes. It has struck me that it is becoming increasingly unusual not to meet or see an IEEM Member in action. It would be interesting to have reports from members on projects in which they may have been involved or where their contribution has been recognised - let us know when you get your invitation to the Palace!

Committee Opportunities

There are still opportunities and indeed a great need for further nominations to the Committees especially the Membership Admissions Committee and the Finance and General Purposes Committee. Nomination papers have been sent out for those wishing to serve on Council or on any of the Committees - why not have a go! There is a great wealth of talent in the membership and people find that it gives them a real insight into the workings of the Institute. It's always good to have a steady stream of people to replace those who have 'done their bit'. Despite a previous call the In Practice Editorial board remains non-functioning and, although there has been a steady stream of very worthwhile papers, they tend to be gathered on an ad hoc basis and sometimes it seems a miracle that we get any at all!

New Articles Needed

Articles for In Practice are always needed.

Each page takes about 1,200 words and papers are welcome up to 4 pages, preferably in 1-page units.

It helps to have articles with good quality illustrations, photos or slides.

We reserve the right to edit or not to publish but most IEEM members who have submitted articles to date have had them published.

It is hoped to maintain future editions at 20 or 24 pages but this will be to some extent dependent on covering costs through advertising, sponsorship and other means.

**Environmental Law
Fourth Edition**

**D. Hughes, T. Jewell, J. Lowther, N. Parpworth and P. de Prez.
ISBN: 0406 942919**

This text covers a wide variety of environmental issues, and puts them into context along with social, political and economic issues.

Environmental Law pays particular attention to issues from England and Wales, within the framework of both EC and international environmental law with reference to wider policy and ethical. This new edition refers to current environmental law, and places it within the rapidly developing EC and international systems of environmental regulation. It also updates the reader on relevant legislation and administrative guidelines.

This book is an established text for law students, but is also relevant to environmental scientists and environmental practitioners. The book is easily searchable, with vast reference and websites listings.

Environmental Law covers four main topics:

Part 1 Environmental Law

Part 2 Protection of the Land

Part 3 Legal protection for the atmosphere and the integrated controls over major polluting activities

Part 4 Protection of the aqueous environment

The book costs £27.95 and is available from the website:

www.butterworths.com

**Freshwater Algal Flora of the British Isles
An Identification Guide of Freshwater and Terrestrial Algae**

D. M. John, B. A. Whitton and A. J. Brook.

ISBN: 0521 770513

Freshwater Algal Flora of the British Isles provides the first modern account and identification guide to more than 2200 species of freshwater algae found in the British Isles with the exception of diatoms. This text has taken over ten years with contributions from more than 20 freshwater experts. Its publication marks the first modern identification guide and summary of British freshwater algae written in English for almost 100 years.

The authors give non-technical descriptions, supported by line illustrations and photographs that emphasise the features significant for identification. The user-friendly keys aid the accurate identification of specimens to the levels of genus or species. Notes are included on ecology, world distribution and any taxonomic problems or identification difficulties.

The accompanying CD-rom photo catalogue of more than 500 spectacular colour images of freshwater algae and their habitats provides a valuable additional reference source and identification tool.

A major step forward is the inclusion of a CD-rom image database, which will help make species recognition faster and more accurate.

Algae species present in ponds, lakes, rivers and streams can indicate the 'health' of fresh water. Thus understanding more about algae is becoming increasingly important with impacts such as the aquatic pollution of fish stocks, blocking drainage ditches, changes in the quality of potable water and the production of toxins.

This accurate identification of algae guide will be important to conservationists, naturalists and professional scientists, particularly those involved in monitoring and managing the freshwater environment.

Overall this book really fills a niche which has been neglected for far too long. The book is available from the Cambridge University Press at £75 website: www.cambridge.org

Dynamic World

Land cover and land use change

A. M. Mannon

ISBN: 0340 80678 8

This book focuses on the fundamental issue of the relationships between people and the environment. Dynamic interactions such as population growth, economic and political forces, resource availability and cultural traditions are manifested as land cover and land use characteristics. The impact of factors as varied as agriculture, urban growth, wastes disposal, war, terrorism and tourism are also considered.

This book explores changes in land cover and land use over the last three million years, as the ice caps have waxed and waned, human life evolved, technology advanced, and the needs of society have developed.

Case studies illustrate the text, with further reading recommendations accompanying each chapter and there is an extensive bibliography and index.

This text will be useful for students of geography and environmental science. It deals with a plethora of human/environmental issues in an approachable manner. It costs £16.99 and is recommended to those interested in a wide variety of environmental issues.

This title is available from Book Point Ltd, Tel: 01235 400454

**Agri-Culture
Reconnecting People Land and Nature**

J. Pretty

ISBN: 185383 9256

Humans have farmed for over 600 generations, production and consumption of food has been intimately connected to cultural and social organization. But over just the last two to three generations, we have developed hugely successful agriculture systems based on industrial processes. There is now higher food production per hectare and per worker than ever before. The author poses the question, is modern farming truly efficient, and asks the reader to consider the harmful by products of intensive agriculture: loss of soils, damage to biodiversity, pollution of water and the harm to human health.

The author looks at the moral shortcomings of industrial agriculture; 'Despite great progress in increasing productivity in recent decades, hundreds of millions of people remain hungry and malnourished, and further millions suffer from eating too much food or the wrong sort'.

Pretty puts forward the expansion of alternative food production methods and consumption patterns founded on ecological principles in conjunction with culture and education, '...true prosperity will depend on the radical reform of the institutions and policies that control global food futures, and fundamental changes in modern thinking.'

This book is interlaced with interesting stories and is not so much a textbook, rather a perspective on global agricultural issues. Pretty discusses many controversial issues from malnourishment of the third world through to genetic modification and leads a strong viewpoint on each subject. The book is eye opening and very readable and I recommend it to people interested in alternative or perhaps radical points of view. The book is priced at £14.95 and is available from Earthscan, Tel: 01903 828800 or www.earthscan.co.uk.

**Connecting with London's Nature
The Mayor's Biodiversity Strategy**

Two thirds of London's land area is green space or water, ranging from gardens and cemeteries to canals and railway land. It also contains important populations of nationally rare plants and animals, such as the stag beetle and the black redstart.

The strategy has been developed alongside the draft London Plan (Spatial Development Strategy) and will make use of statutory planning powers outlined in the plan to protect the green spaces. The Mayor will also seek to ensure that major new developments referred to him include measures for habitat creation.

In addition to the 137 Metropolitan sites, the Mayor is calling on London's boroughs to identify and protect their own natural areas of more local significance, numbering around 1000. Together these will take up nearly 20% of London's area.

As well as safeguarding London's important natural sites, the Mayor has agreed a 10 year programme to monitor habitats in the city and to identify key areas where people still have limited access to the natural environment.

The strategy also aims to:

- Work with the metropolitan police to make sure species protection is enforced in London and to develop a programme to clamp down on the worldwide illegal trade in endangered species.
- Establish new principles in the use and management of London's waterways under his newly formed Blue Ribbon Network for the Thames and other Waterways.
- Promote public access to green spaces.
- Prepare a framework to protect London's trees.
- Work with the London Development Agency, councils and the business sector to encourage greening initiatives in building developments.
- Promote an annual London Wildlife day.

The Mayor's London strategy involves 14 different policies all subdivided into bullet points of specific goals. The policies vary from surveying and monitoring sites to the promotion of environmental education and a free visit to London zoo for all metropolitan school children. The strategy is comprehensive and seems to involve the majority of stakeholders, from London's public through to development companies. This is a great step forwards in promoting sustainable development for the city of London. *Connecting with London's Nature* is the first general biodiversity strategy for London, collectively guiding the boroughs, since the mid 1980's. The results of Biodiversity strategy will be watched with interest.

H₂Opportunities

The Environment & Product Quality Team has a broad remit within Southern Water, advising on ways of improving environmental management and performance, then reporting on progress made. In these key roles within the team, you'll provide technical leadership on environmental inputs across all of the company's core activities.

Principal EIA Scientist

£28,000 - £34,000 depending on experience Brighton

Overseeing the provision of technical environmental advice on all our construction scheme impact assessments, you'll project manage specialist environmental inputs and supervise less experienced staff within the team.

This is a diverse role, where you'll become involved in reviewing design briefs, undertaking construction scheme assessments and designing and implementing mitigation and restoration plans. Development of site environmental management plans, construction monitoring and EMS site audits all add to the attraction of the post.

You'll need significant relevant consultancy or industry experience including pipeline and wastewater treatment schemes, project management skills and knowledge of relevant UK environmental legislation. A specialist interest in ecology, EMS implementation and audit on construction sites and/or contaminated land would be desirable.

Senior Freshwater Ecologist

c£26,000 depending on experience Brighton

As part of a team of environmental professionals, you'll develop and implement environmental performance strategy, provide technical advice to construction schemes and strengthen our commitment to pollution control.

Evaluating design briefs and impact assessments for our investment programme will be key to your remit. You'll also be responsible for investigating, mitigating and reporting on means of preventing pollution to the aquatic environment and associated biological impacts.

You'll have at least five years' relevant experience including EIA, preferably in relation to water supply and wastewater treatment, combined with a working knowledge of freshwater biological evaluation methods and project management skills.

For informal enquiries, please contact Mike Barker, Team Manager, tel: 01273 663144.

With plenty of development opportunity and a competitive salary, we also offer the extensive benefits package that you would expect from a large company.

To apply, tap into our website below or send a CV and covering letter to: Theresa Cooper, Human Resources, Southern House, Lewes Road, Falmer, Brighton BN1 9PY, or email theresa.cooper@southernwater.co.uk



Southern Water

www.southernwater.co.uk/jobs

Environment UK 2002

The Environment Agency's annual conference is to be hosted in partnership with the UK's leading environmental organisations. Offering a platform to discuss the challenge of sustainable development and its implications for the UK. The conference is held on the 22nd and the 23rd of October, at Stoneleigh Park Exhibition and Conference Centre, Warwickshire. For more information contact the EA or go online to www.environment-agency.gov.uk

Help on the way for Argyll's Black Grouse

Work has begun to reverse the decline of black grouse *Tetrao tetrix* in Argyll and Bute. The Argyll and Bute Black Grouse Recovery Project aims to ensure that the birds, whose numbers throughout Britain have plummeted over the past decade continue to thrive in the Argyll area. Mr Wilson said. "The UK population is estimated to have declined from 25,000 males in 1990 to about 6500 by 1996, giving us cause for concern about their future". Habitat loss and fragmentation has been the main cause for the decline in these charismatic birds. Black grouse prefer a patchwork of long and short heather, sparse woodland cover and wet and boggy areas. The Argyll and Bute Black Grouse Recovery Project is a collaboration between the Forestry Commission, SNH, RSPB and Scottish Power.

Butterflies on the net

The world's largest data set of butterfly distribution records went online through the National Biodiversity Network Trust site in May. The findings of the millennium Atlas survey of butterflies in Britain are now freely available to all on the www. Over 10,000 members of the public sent in their sightings and over 1.8 million butterfly sightings have been summarised. The survey findings did paint a somewhat gloomy picture. However, 15 species of butterflies including the Essex Skipper and the Brown Argus have doubled their range since the 1970's. Proof of global warming? The survey shows that the public can make a substantial contribution to scientific advancement. www.butterfly-conservation.org

Moors of the Future

Significant parts of the Peak District's dramatic moorlands are to be restored through the Heritage Lottery Fund commitment to the environment. A grant of £3.1 million will enable an area partnership scheme, led by the Peak District National Park Authority, to implement a land management strategy.

The Moors of the Future Project covers the Dark Peak and the South West Peak areas of the Peak District, stretching from the East Midlands, through to the North West. These moor lands, surrounded by large urban centres which have suffered from major industrial decline over the last thirty years, provide a vital escape for city dwellers. The land comprises upland heath and blanket peat bog habitats. This rare landscape is home to some of the country's most endangered bird life including, curlew, dunlin, golden plover, short eared owl, merlin, ring ouzel and snipe.

The Peak District is the second most popular national park in the world; approximately 22million people visit it annually. The footpaths are used extensively and as a consequence have suffered from substantial damage. Though a comprehensive improvement scheme, a network of paths will be created which will help prevent future erosion. The project will aim to restore 3 square km of the worst affected areas and 19km of over-used moorland along the paths, which have been worn into deep gullies and scars.

The Stone Curlew – A Military Secret

The stone curlew is one of the UK's rarest birds, with only 270 breeding pairs. Nearly a quarter of the UK's population is known to breed at Porton Down and Salisbury Plain, with a further 12 per cent breeding on adjacent farmland. Their numbers have declined substantially over the last 50 years

from changes in their habitats land use. In the UK the stone curlew is only found in Wessex and in the Brecks of East Anglia.



A stone curlew at Porton Down (courtesy of RSPB)

The Range at Porton Down, near Salisbury, is a unique 'living time capsule' caused by the absence of agriculture, which has resulted in nearly a century of unchanged landscape and wildlife. The vast number of rabbits has also aided the stasis of habitats at Porton Down. With such a large grazing pressure the site has not been affected by succession.

Defence Science and Technology Laboratory (DSTL) Porton Down was established in 1916 to provide offensive and defensive means to counteract the chemical and biological weapons, which were used during the First World War. It is a site with no unauthorised access, allowing vulnerable species such as the stone curlew to be left to their own devices.

Due to the nature of the Porton Down many people have not had the opportunity to explore the quality of the area's wildlife. A web cam has been sited on Battery Hill in the Range at Porton Down. It will provide a valuable research tool and allows the public to view this site for the first time in nearly a century. Everyone will be able to see nesting stone curlew via the Internet. This is an exciting educational opportunity for both young and old. Although the images going onto the website are not live, because of military restrictions, the quality of the image more than makes up for this. There is talk of increasing the quality of the images and also the installation of an infra red camera for night viewing.

This is a great opportunity for bird lovers, and the web cam can be viewed from either the RSPB www.rspb.org.uk or the English Nature websites www.english-nature.gov.uk.

For further information on this story contact Stuart Corbett sjcorbett@dstl.gov.uk

What lives where and why?

Exploring Biodiversity is a new website that provides a unique interactive introduction to UK biodiversity. Developed by scientists, educators and conservationists from the Natural History Museum along with Flora and Fauna. This site is excellent and incredibly informative it will entertain today's cyber youth for hours. *Exploring Biodiversity* is designed to introduce the concept of biodiversity to GCSE and A level students and also the general public.

This website is highly interactive and has some intriguing exercises to undertake. I thoroughly enjoyed using this site and deeply recommend it to parents and teachers who want to use an interactive approach to enthuse students about biodiversity issues. I must give this warning though; there are portions of this site that are open discussion groups for students some of the language found may not be very relevant.

The web address is www.nhm.ac.uk/eb

Prospective members of IEEM

The following people have applied for membership of IEEM. 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 8th November 2002. Any communications will be handled discretely. The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from Council but may be taken by Council itself.

Name	Applied for Full (F) or Associate(A)		
Dr	Katherine E.	Barlow	F
Mr	Simon J.	Barron	F
Mr	Craig A.	Best	A
Ms	Caroline M.	Bird	F
Mrs	Ann M.	Blackburn	A
Ms	Karen A.	Blake	F
Mr	Nicholas J.	Bonsall	A
Miss	Sharon N.	Bracken	A
Dr	Amanda	Browne	F
Miss	Lindsay P.	Carrington	A
Ms	Rachel	Chase	A
Mr	Gerard	Cheshire	F
Mr	Nicholas R.	Clark	A
Mr	Stuart M.	Colgate	A
Mr	Richard I.	Collinson	F
Mr	Glen A.	Cooper	A
Ms	Alison	Cox	F
Mr	Ian R.	Curtis	F
Ms	Nicola A.	Dunn	F
Mr	Hugh A.	Firman	F
Mr	Andrew P.	Foster	F
Mr	Darren	Frost	F
Mr	Dominic R.J.	Gane	A
Dr	Lorraine H.L.	Gormley	F
Miss	Angela M.	Graham	F
Dr	Adrian	Hailey	F
Mr	Stephen	Heery	F
Mr	Ian J.	Herbert	F
Ms	Rebecca Y.	Hewlett	F
Miss	Joanna	Hodgson	A
Mr	Alan	Hopkins	F
Mr	Robert	Hutchinson	A
Mr	Richard J.	Jennings	F
Mr	Matthew	Johns	F
Mrs	Angela M.	Khalil	F
Mr	Neil S.	Lee-Gallon	F
Dr	Martin d'A.A.	Le Tissier	F
Mr	David	Long	F
Miss	Purgle S.	Linham	F
Miss	Suzanne	Mazdon	F
Ms	Geraldine M.	McGowan	F
Mr	Andrew D.J.	Mcllwraith	A
Miss	Nicola A.	Mogford	F
Miss	Claire N.	Munday	A
Ms	Mieke	Muyllaert	A
Ms	Joanne	Myers	F
Mrs	Angie	Neave	A
Miss	Catriona J.	Neil	F
Ms	Genevieve M.	O'Farrell	A
Mr	Simon M.	Phipps	F
Miss	Hannah M.	Price	A
Mr	Ian L.	Ralphs	F
Miss	Nicky J.W.	Richardson	A
Dr	Sheila M.	Ross	F
Mr	Jonathan J.	Rudge	F
Miss	Jackie	Taylor	A
Miss	Natascha	Tilbrook	A
Ms	Susie E.	Udall	F
Mr	Christopher	Vine	F
Ms	Jan. M.	Walters	F
Mr	John	Wann	F
Mr	Derek A.	Whitcher	A
Mrs	Catherine A.	White	F

Students

IEEM is pleased to welcome the following as new student members: Miss Alison F. Aldous, Mrs Vittoria Annoscia-Thornley, Miss Julie Bremner, Miss Fiona C. Clark, Mr Glenn J. Langler, Ms Sally M. Mackenzie, Miss Sophie E. Middleton and Miss Alison E. Morse

Affiliate

IEEM is pleased to welcome Mr Stephen C. Markham and Miss Caroline Munns as a new Affiliate Members.

Upgrades

The following have successfully upgraded their membership from Associate to Full: Mr Robert R. Bearne, Mr Philip Belden, Ms Helen Lucking and Mr Mark Woods

New Admissions to IEEM

IEEM is pleased to welcome the individuals listed below who have now been admitted as new members.

Name	Grade admitted		
Miss	Victoria A.	Allen	A
Miss	Victoria M.	Allen	A
Dr	Philip	Bacon	F
Mr	Richard C.	Bennett	F
Dr	Jane A.	Burch	F
Dr	Helen J.	Byron	F
Mr	James	Calow	F
Mr	Rory T.	Canavan	F
Mr	Ian M.	Cappitt	F
Miss	Clare	Cheeseman	A
Dr	Martin	Christmas	F
Dr	Matthew J.	Clarke	F
Ms	Fiona E.	Corby	F
Dr	Matthew J.R.	Cowley	F
Miss	Lisa A.	Curtis	A
Mrs	Dorothy M.	Dahl	A
Mr	Graham S.	Davison	A
Miss	Michelle J.	Dear	A
Miss	Judy A.	England	F
Mrs	Alison M.	Espie	F
Mr	Derek	Finnie	F
Mr	Sean P.	Flynn	A
Mr	Martin P.	Fuller	F
Ms	Isobel M.	Girvan	F
Mr	Gary	Grant	F
Mr	Giles M.	Groome	A
Ms	Lorna	Hall	A
Dr	Jeremy M.	Hills	F
Miss	Rachel L.	Hoskin	A
Miss	Pamela J.	Hudson	A
Mr	Adam M. J.	Ingleby	F
Mr	Russell A.	Lisk	A
Mr	Christopher J.	Lowe	F
Mr	Benjamin C.	Lutyens	A
Miss	Heather L.	Mansfield	A
Mr	Roger K.	Martindale	F
Mrs	Pauline	Michell	A
Mr	Jol	Mitchell	F
Mr	Stuart D.	Moodie	A
Dr	Evelyn A.	Moorkens	F
Miss	Samantha	Munslow	A
Mr	William	O'Connor	F
Mr	Michael R.	Outhwaite	A
Miss	Jennifer	Park	A
Mr	Stephen	Parnwell	A
Mr	Christopher R.	Pary	F
Mr	Julian R.	Perrett	F
Mr	Philip J.	Pope	F
Miss	Hannah J.	Powell	A
Mr	Neil T.	Punchard	F
Miss	Beverley K.	Rhodes	F
Mr	Martin	Schofield	A
Miss	Caroline J.	Soubry	A
Mr	Guy	Stone	A
Mr	Peter J.	Stronach	A
Mr	Clifford C.	Stuckey	F
Ms	Sofie A.	Swindlehurst	A
Miss	Diane	Taylor	A
Mr	Hayden	Torr	A
Miss	Charlotte C.	Webbon	A
Mr	John P.	Wenman	F
Miss	Nikki	West	A
Mr	Andrew R.	Westgarth	F
Mr	Steven M.	Williams	F
Miss	Sandie D.	Wilson	A
Mr	Stuart F.	Wilson	F
Mr	Michael D.	Wood	A

The Course programmes for 2002 for the Centre for Alternative Technology, The Field Studies Council, Losehill Hall, Plas Tan-y-Bwlch and BTCV are all now available. Each offers a wide range of courses that might be of interest to IEEM members. Information from:

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

Tel: 01654 703743, Fax: 01654 703605, E-mail: joan@cateducation.demon.co.uk.

Field Studies Council: For a copy of the FSC Courses 2002 brochure, contact FSC head Office, Preston Montford, Montford Bridge, Shrewsbury, Shropshire, SY4 1HW. Tel: 01743 850 674, Fax: 01743 850 178, E-mail: fsc.headoffice@ukonline.co.uk.

Losehill Hall: Details from Losehill Hall, Peak District National Park Centre, Castleton, Hope Valley, Derbyshire S33 8WB
Tel: 01433 620373, Fax: 01433 620346, E-mail: training@losehill.u-net.com.

Plas Tan-y-Bwlch: Details from: Plas Tan-y-Bwlch, Maentwrog, Blaenau Ffestiniog, Gwynedd LL41 3YU. Tel: 01766 590324, Fax: 01766 590274, E-mail: Plastanybwllch@compuserve.com.

BTCV Courses: - practically based. Details from: BTCV Training Programmes Unit, Red House, Hill Lane, Great Barr, Birmingham B43 6LZ. Tel: 0121 358 2155, Fax: 0121 358 2194, E-mail: ETN@ukgateway.net

2 October. 100 Years of Japanese Knotweed in Glamorgan - A Knotweed Control Seminar. The Guild Hall, Swansea.
Details from: Sean Hathaway, Environment Officer City and County of Swansea, Tel: 01792 635719 or email: sean.hathaway@swansea.gov.uk

7 - 9 October. NSCA Environmental Protection. Glasgow.
Details from: The National Society for Clean Air, Sally May.
Tel: 0273 878776

9 - 10 October. International Nearshore Pipelines Conference 2002. Oxford Natural History Museum.
Details from: Ms Jackie Harrop, conference coordinator.
Tel: 01491 822389, email: jha@hrwallingford.co.uk

16 October. Environmental Education and Interpretation Pitlochry. IEEM Professional Development Programme.
Details from: IEEM office.

17 October. Earthwatch Europe Lecture. The Earthwatch Balloon Debate: Threatened Habitats.
Details from: Earthwatch institute Europe email: info@earthwatch.org.uk

22 - 23 October. The Environmental Conference. National Agricultural Centre, Warwickshire.
Details from: The Environment Agency Press office: Tel: 020 78638710 or www.environment-agency.gov.uk/aboutus

22 - 24 October. Sustainable Energy EXPO. Olympia, London.
Details from: Websites: www.sustainable-expo.org or www.energy-expo.org
Tel: 020 79155171

23 October. Stakeholder Analysis. Telford area. IEEM Professional Development Programme.
Details from: IEEM office.

26 October. Marine Conservation Society Annual Conference 2002. Royal Museum Edinburgh.
Details from: www.mcsuk.org.

29 - 30 October. Renewable Bioenergy: Technologies, Risks and Rewards. London. Institute of Mechanical Engineers.
Details from: Helen Richardo Tel: 020 79731304.

30 - 31 October. Nature Conservation: Who Cares? - People, Politics and New Perspectives. Market Bosworth, Leicestershire.
Details from: Steve Berry Tel: 073 476595 or email: steve.berry@english-nature.org.uk

30 October - 1 November. Oceans of Change. National Maritime Museum, London.
Details from: Janet Norton, Tel: 020 8312 6716 or email: research@nmm.ac.uk

2 November. Trees and People. Moira, Leicestershire
Details from: The Woodland Trust Tel: 0800056 0643

6 November. Integration of Conservation and Agriculture - Livestock Farming. Stokesley North Yorkshire. IEEM Professional Development Programme.
Details from: IEEM office.

6-9 November. International Conference, Nature and People – conservation and management in the mountains of Northern Europe. Scottish Natural Heritage. Pitlochry.
Details from: Helen Forster tel: 0131 446 2420 or email: Helen.forster@snh.gov.uk

13 November. Sustainable Construction: Laying the Building Blocks. CIRIA. London.
Details from: Laveen Manku, Tel: 020 7228891

13 November. Proof, Cons et al.: Preparing for Public Inquiry. Basingstoke Hampshire. IEEM Professional Development Programme.
Details from: IEEM office.

18 - 21 November. The BCPC Conference - Pests and Diseases 2002. Brighton.
Details from: BCPC Tel: 01252 727194 or email: md@bcpc.org.

27 - 28 November. IEEM Annual Conference and AGM - Aspects of Urban Ecology. Newcastle Airport. Britannia Hotel.
Details from: IEEM website www.ieem.org.uk or soon available from IEEM Office.

18 - 20 December. BES Annual Winter Meeting. University of York.
Details from: British Ecological Society. For Details Press Officer Betsy Allen Tel: 01223 570016 or Email: beckyallen@britishecologicalsociety.org

5 - 6 December. Gathering and Using Information: Association for the Study of Animal Behavior Winter Meeting. London Zoo. Details from Melissa Bateson Tel: 0191 2225056 or email melissa.bateson@ncl.ac.uk.