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The Kennet & Avon Canal Restoration Project From a Water Vole's perspective

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Introduction

The 200 year old Kennet & Avon Canal (K&A) runs between the Bristol Avon and, via the River Kennet, the Thames at Reading. It crosses five Natural Areas in its 87 miles (140km) and is a significant freshwater corridor through the central Wiltshire chalklands. The K&A has 104 Locks, 215 bridges, 203 Listed structures, 2 AONBs, 5 SSSIs, 24 Conservation Areas, 1 World Heritage Site and several lengths of County Wildlife Site. The canal, originally built for goods transported by horse drawn boats, has become a major leisure resource for both local communities and holidaymakers and is visited by an estimated 10 million cyclists, anglers, walkers and boaters every year.

Though re-opened to through navigation in 1990 the canal had been largely disused and funds for management were scarce until 1997. Low disturbance and extensive habitat encouraged good numbers of water voles (*Arvicola terrestris*). In fact, water voles were so familiar to those working on the canal or using it that it came as a surprise to many that the species was in trouble nationally.

This article provides a review of the water vole issues arising during the recent restoration of the canal and an overview of the solutions found to maintain the resident water vole populations.

The Kennet & Avon Canal Restoration Project

In 1997 the Kennet & Avon Canal Partnership, consisting of British Waterways, the K&A Canal Trust, the seven riparian local authorities and the Association of Canal Enterprises, was successful in a bid to the Heritage Lottery Fund (HLF). The canal suffered from severe leakage and structural problems as well as an irretrievable backlog of maintenance, threatening the canal's future. The partnership was awarded £25 million to undertake urgently required repairs, smaller scale operations such as bank protection and environmental improvements like path construction & tree planting.

To ensure that these works were undertaken in accordance with the Heritage Lottery Fund's parameters, the latter appointed project monitors from Ove Arup and Partners, English Heritage, English Nature and the Countryside Agency. One of HLF's first requirements was for the development of a

conservation plan, to guide the five-year programme of works and to protect the K&A Canal's unique environment & heritage beyond the life of the HLF Project.

The Project's programme of restoration works was developed & implemented by a multi-disciplinary Project team, which included engineers, a landscape architect and an ecologist. Their aim was to assess each individual project and develop designs that not only satisfied the engineering requirements, but also achieved the delicate balance between the operational needs and the local natural & built heritage. This approach, often using traditional techniques in new ways, guided by the canal's Conservation Plan is illustrated in Figure 1.

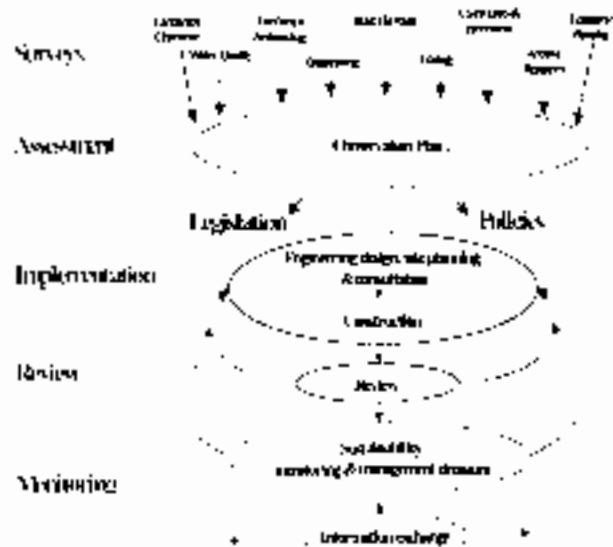


Figure 1: Diagram of the Project's work process, guided by the Conservation Plan.

Canals & water voles

There are over 2000 miles of canal in the UK and all, with the exception of a small proportion which is modified river navigation, are man-made channels. Original construction employed clay-puddle linings, drystone walls of local stone, brickwork and similar hand-laid construction. Relatively stable water levels make canals particularly attractive to water voles and sections with natural earth banks and plentiful aquatic and bankside vegetation will always have been prime habitat. Water voles are now frequently found in towpath bank washwalls, where the masonry has deteriorated. Whilst water voles in the wider countryside have suffered massive and well-documented population crashes, in the last 30 years the canal population has shown some resilience. One waterway with strong water vole colonies is the K&A Canal.

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Contents

- 1, 3-6** *The Kennet and Avon Canal*
Oda Dijksterhuis, MIEEM and Viv Phillips, MIEEM
- 7-8** *Deconstructing EU Legislation*
Greg Carson, MIEEM
- 9-10** *The IEEM 10th Anniversary Membership Survey*
Mike Barker, MIEEM
- 11-14** *In the Journals*
Pat Rae, MIEEM, Peter Shepherd MIEEM, Jim Thompson & Joel Bateman
- 15** *Bryophytes*
Paddy Coker, MIEEM
- 16-18** *Institute News*
- 19** *Working together fro the Countryside*
Peter Beale, MIEEM
- 20** *Recent Publications*
- 21-22** *News in Brief*
- 23** *New Members*
- 24** *Diary*

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DEVELOPMENTS IN ECOLOGY AS A PROFESSION

Much has changed within the discipline of ecology in the past 10 years. The work place is now geared heavily towards nature conservation and broad environmental management rather than "pure" ecology. To a large extent there is now less reliance on the scientific principles underpinning ecology, and more emphasis on 'inventory' ecology, i.e. How many of them are there and where are they? Whilst there is still a need to produce graduates who understand basic ecological principles, the practice of ecology in the commercial and statutory world is demanding a different type of graduate from many being produced from the academic institutes. This is abundantly clear when one comes to recruit new staff.

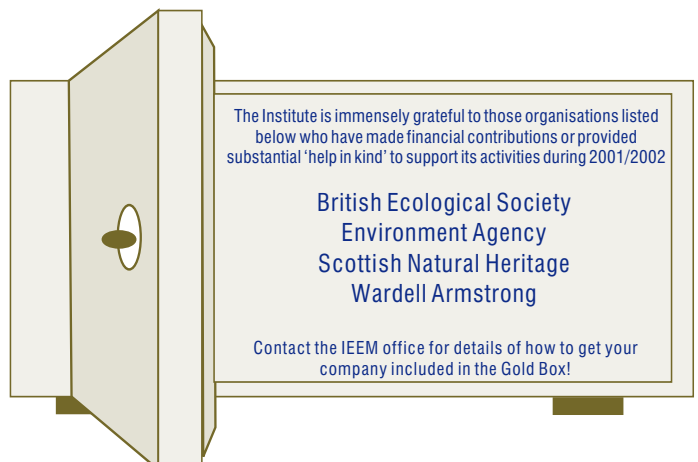
The skills gap can be divided into three broad categories. Firstly, there is often a requirement for a good background knowledge in natural history. The ability to identify a group of organisms is an essential tool for the graduate ecologist. However, we find that very few graduates are able to identify taxa to a level which would make them proficient as a practising ecologist. Plant identification skills, even amongst some graduates with degrees biased towards botany, are often very poor. Whilst some roles may not require an ability to identify, say, all the grass species present, it is important that the individual can assess the quality of such data presented within reports such as Environmental Statements. Not only are identification skills lacking, but most graduates seem to lack knowledge of some of the basic ecological classification tools being used to underpin nature conservation in the UK, principally Phase 1 survey and the National Vegetation Classification. Secondly, many ecological positions (e.g. local authority ecologist or statutory agency) require a significant understanding of environmental legislation and this seems to be lacking. This is crucial to enable ecologists to deliver the advice expected from them. Thirdly, graduates would benefit significantly from a basic training in business management and working in an office environment with other people who may be trained in very different disciplines.

The problem is not confined to producing graduates with appropriate skills. There also seem to be difficulties in retaining an adequate supply of senior, experienced staff. We know of some consultancies having spent at least 4 months recruiting appropriate senior staff.

There is a real risk that, in the absence of appropriately trained ecologists, staff trained in other environmental skills may assume an increasing responsibility for ecological-related issues. This will act to further dilute the skills and knowledge base in the profession.

It is in all our best interests to make sure that there are good graduates available. Perhaps it is time to review the structure and content of courses to ensure that they are meeting the needs of the employer. **Members are invited to send their views on this debate to the Secretariat. IEEM will want to develop this further.**

David Hill, President, & Sue Bell, President-elect, IEEM



K&A water vole issues

Survey information began to be gathered in 1996, initially during a detailed assessment of potential otter habitat undertaken by Wilts Wildlife Trust (WWT) for BW and later as dedicated surveys involving BBOWT's and WWT. Water voles were found throughout the waterway but were particularly strong in the east in the Kennet valley and in the west from Devizes to Bath. The River Kennet section of the canal is now a designated Key Site for Water Voles by Berks, Bucks, Oxon Wildlife Trust. The importance of the canal for water vole habitat was compounded by the changes to the Wildlife & Countryside Act 1981 and the protection of water vole habitat under Schedule 5 in 1998. This created the need for a new approach to water vole habitat when planning and undertaking engineering works.

General approach

In preparation for any work affecting the canal channel or banks, water vole surveys were included in the data gathering in the summer prior to the predominately winter works.

Impacts on short sections of bank were addressed by strimming both the marginal fringe and verges down to bare soil 5 days prior to work starting. This takes away the cover and food source and encourages the animals to concentrate their activity on other parts of their habitat. Many projects affecting one side of the canal, such as construction of visitor moorings and 25m lock landings were managed in this way. It was agreed with English Nature to improve equivalent lengths of habitat, where permanent loss of medium or high-density water vole habitat could not be prevented.

For all larger works a decision had to be made between allowing water voles to remain on site or their removal. It was necessary to consider population survey data in relation to the extent of the engineering work, including the temporary aspects such as site access and compound areas, set against any availability of suitable unaffected adjacent habitat.

The establishment of good quality habitat sustainable for the long term was considered the priority when balancing resources to be spent.

Decision making in the project team was aided by specialist expertise from Oxford University's WildCRU who undertook surveys, advised on project strategy and, where required, dealt with trapping, "storage" and release back to site once the habitat became suitable. Water voles were kept in captivity, including some which contributed to Bristol Zoo's endangered

species breeding programme. Experience showed that they are uncomplicated captives and breed well in pairs kept in simple cage facilities.

Water Vole Habitat Case Studies

Prior to developing designs and work processes, each site was assessed individually and the specific environmental sensitivities, such as the ecology and also landscape and local archaeology and recorded. The three case studies below focus on the water vole habitat issues and illustrate several of the mitigation techniques and designs that were used to incorporate water vole habitat in what were in essence construction works to resolve engineering problems.

The Project team would develop a number of different solutions in tandem, of which one or sometimes an amalgamation of several of the preferred solutions would be selected. Considerations for these choices included engineering requirements, cost, life span, people/user requirements, ecological issues, heritage issues and landscape requirements. This decision-making process was very much a robust one, whereby the different professionals represented in the Team, as well as local Waterway staff and Partnership representatives, negotiated and worked together to reach the optimum compromise for each site.

Case study 1: PVC & Concrete channel relining in the Bath Valley

Aim of the works

The biggest single engineering project funded by the HLF Award was dedicated to addressing the long history of failure and canal leakage in the Bath Valley. Travelling east from the outskirts of Bath the canal contours along the River Avon Valley high above the river and the Bristol to London railway line on a hillside destabilised by spring water flow. The canal was typified by broad marginal fringes of *Glyceria maxima*, soft offside banks and tumbled down washwalls with strong water vole colonies and attractive towpath verges with good plant diversity.

The 6km of relining required, undertaken in 3 phases, was effectively equivalent to digging a new canal on the line of the old, such was the unavoidable level of destructive preparation. Planning the project needed integration of complex engineering design and measures to save and restore important habitats and species, and to build a suitable basis for establishing sustainable habitats.

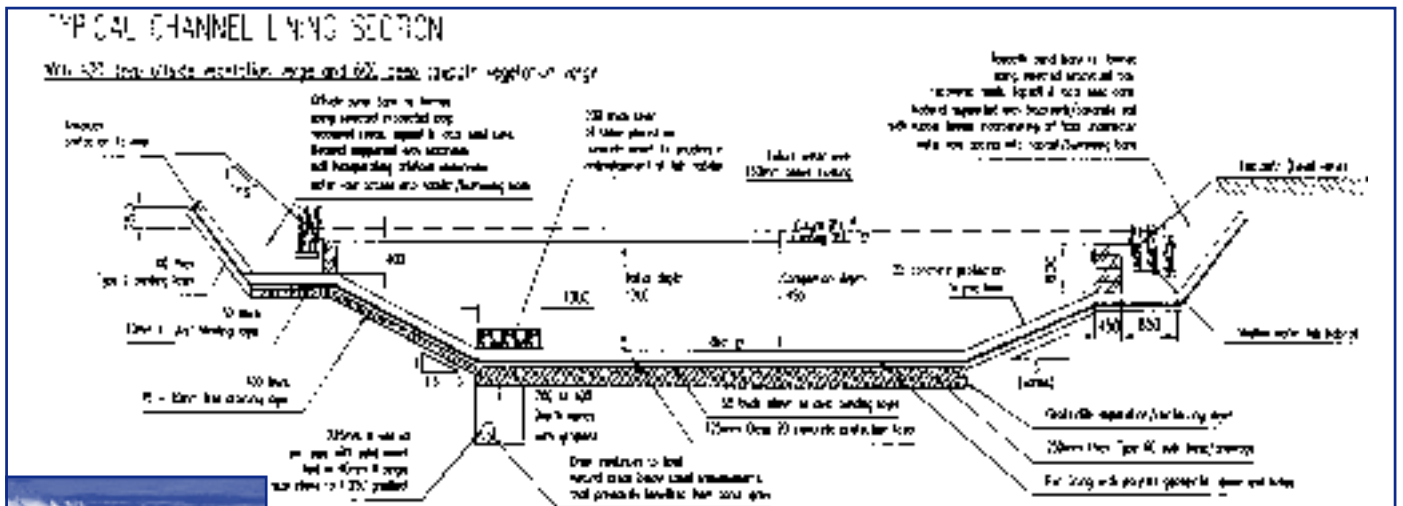


Figure 2: Design of the PVC & concrete lining, including the marginal shelves supported by the submerged retaining wall. Engineering solution / design selected

Figure 2 shows the successful design for the relined channel. The choice of PVC liner protected by concrete was dictated by the constraints of the site, especially the working room available. Shallow marginal shelves within the lined area were crucial to developing good channel habitats; protected by a submerged retaining wall. These were built continuously along the offside and on both sides where practical. Aquatic emergent plants removed from the original channel and stored during the construction period (over winter) were replanted along the shelves. Earth banks were included on the offside margins to provide water vole burrowing habitat which keyed into natural bank above the liner. There were some problems in creating stable slopes to the earth banks in phase 1, resolved in later phases by extending the banks over the whole width of the shelf. Burrowing conditions in the earth banks in phase 1 were hindered by use of stone riprap to anchor the marginal plants, in later phases stone was replaced with clay-rich soil and the plants rooted without problem. The underwater entrances to the stony shelf habitat were improved by using flexible ridged plastic pipes, but as backfill became more burrowable in later phases there was no need for pipes.

Verge topsoil was stored and reused along the new towpath verges and adjacent habitats were protected from damage and stream inflows were incorporated into the lined channel.

Water vole mitigation and methodology - before & during the works

Measures to protect water voles were a key focus for the project; the techniques and designs were adapted as the phases progressed but essentially the initial process remained in place. WildCRU provided the specialist expertise. Pre-works survey was followed by trapping and removal of either all or a proportion of the animals immediately prior to the works as de-watering began.

Each phase of construction took about 5 months with the canal reopened to navigation each year for Easter. Recovered water plants placed in the new marginal shelves showed immediate growth with a surprising apparent increase in species diversity as *Glyceria* domination was set back and other species were able to flourish. Colonisation of the earth banks was slower but had about 50% cover at the end of the first growing season.

Recovery & development

Despite minor problems noted above, the habitat in phase 1 was suitable for re-introduction of water voles in the second summer after construction. 20 animals were released using a soft technique in which the water voles burrow out of safe holding cages in their own time. The animals carry individual microchips and half were radio collared. Surveys have shown that the population is expanding successfully.

In phase 3, adjacent habitat had been judged to be able to accommodate at least a proportion of the population. Consequently half of the population was trapped and the remainder left in situ. When assessing the readiness of the habitat over one year later, this strategy proved effective and a thriving water vole population was present on the restored canal.

The dispersal of released animals and the population dynamics of the water voles on the full length of the restored Bath Valley continue to be monitored. Although initial signs are positive, only time will tell whether this busy section of canal can continue to support water voles.



Figure 3: Photographs taken during and 2 years after the construction of the PVC & concrete lining in the Bath Valley.

Case study 2: Lake creation & piling in the canal embankment at Sells Green

Aim of the works

At Sells Green, a 0.5km section of canal embanked on both sides was in urgent need of attention to prevent serious leakage. The traditional engineering solution to this problem would have been to drive steel piling at the interface between water and bank, but this was ruled out because of the presence of thriving water vole colonies in both banks. Sheer numbers of burrows in the offside bank were leading to rapid erosion of the habitat. The project secured the colony's long term future.

Engineering solution / design selected

Instead of bank face piling, the towpath bank was sealed against leakage by driving deep piles through the surfaced central section of towpath into the underlying impermeable clay, thereby retaining undisturbed soft bank habitat at the water's edge.

On the offside the embankment's condition was too fragile to use deep piling without re-building which would have been destructive and expensive. However, investigations showed that the land adjoining the canal was underlain by impermeable clay. An area of this land was purchased and the canal allowed to flood into it, via two breaches created in the offside bank, to form shallow lakes designed to attract a wide range of wetland wildlife. This elegant solution -which simultaneously solves the leakage problem (with no leakage beyond the lake) whilst creating a valuable wetland habitat- was proposed originally by engineer John Jackson.

Water vole mitigation and methodology - before & during the works

For engineering reasons the canal had to be de-watered during the works, but the banks and marginal fringes were largely undisturbed. On the towpath side the deep piling line was outside the active burrowing area. The offside bank breaches were only 4m wide.

Recovery & development

Water voles were found to quickly colonise the new lake, in addition to maintaining their territories along both banks of the canal and so the local habitat has increased significantly.



Figure 4: Photographs taken during and 6 months after the construction of the new offside lake & piling works at Sells Green.

Case study 3: Steel sheet piling of visitor moorings and bridge & lock landing stages

Another part of the Project involved improving facilities for canal customers, including the construction of safe & easy-to-use visitor moorings, permanent moorings and bridge & lock landing stages. The British Waterways standard for such moorings & landing is a vertical, hard, often piled edge. Without the hard edge the canal banks erode away rapidly due to the wash created by repeated boat movements. This creates unsafe conditions for boat users, washes away the towpath and in some cases can cause instabilities within the canal bank as the clay liner of the canal is washed away. This has the potential to lead to breaching of the bank.

The locations of the landings & moorings were long established and often associated with facilities such as locks & bridges, water points, town centres, cafés and pubs and so could not be reasonably relocated. As a consequence design of moorings & landings had to be reviewed, and a strategy to compensate for the inevitable loss of habitat developed.

Mitigation was achieved by using the three designs shown below:

1. The hazel faggot vegetation shelf

Aim of the works

Hazel faggots were used to protect collapsing canal banks with water vole habitat from further erosion, while at the same time improving the habitat by re-establishing the marginal vegetation fringe.

It was applied to over 1km of canal, with or adjacent to existing water vole habitat and on riverine sections of the canal, set in relatively rural locations and outside major centres of boat & visitor activity.

Engineering solution / design selected

Hazel faggot vegetation shelves are a technique widely used on rivers for hundreds of years. The established design was adapted for use on canals

with the help of the Cain Consultancy. The basic structure is made up of reinforced hazel faggot bundles staked in front the canal bank behind a woven hazel hurdle. This is then filled with soil and planted with fringe vegetation of local provenance. The shelves finish just below normal water level and provide a secure medium for plants to root in, so dissipating the wave action from boats and preventing the marginal fringe from washing away.

Water vole mitigation and methodology - before & during the works

This technique leaves existing water vole habitat undisturbed, as the structure sits in front of the canal bank and installation is done by hand with the canal in water. Water voles have been seen sitting on the unfinished shelf while work was going on.



Figure 5: Photographs taken before and 6 months after the construction of a hazel faggot vegetation shelf.

2. The steel sheet piled vegetation shelf

Aim of the works

The principle of this technique is the same as the hazel faggot vegetation shelf, and although it is less environmentally friendly it is much more robust, has a longer life and can cope with a much higher boat impact rate.

This technique was used on or adjacent to existing water vole habitat on sections of canal that suffered from bank erosion, in areas with high boat use and visitor numbers or on sections of canal with banks in an extremely poor condition. This method was applied on more than 500m of canal bank.

Engineering solution / design selected

This method involves piling a line of steel sheets to below normal water level, in front of the existing bank. The piles are fixed with a fender, to protect boats from damage and back-filled with soil. Coir rolls (coconut fibre roll) are tied down directly behind it, parallel to the bank. Both the coir roll and the soil backfill were subsequently planted with marginal species of local provenance.

Water vole mitigation and methodology - before & during the works

This installation method is more invasive than the hazel faggots method as heavy machinery is required to drive the steel sheet piles down to the desired level. To minimise compaction of the bank, water based machinery was used where possible. In most cases this type of steel piling has to be tied back in to the bank at regular intervals to keep it from tilting. To achieve this, 1m sections of bank need to be dug out every 4m, so that tie-rods can be installed.

As the installation process may damage water vole habitat, all bank side and canal verge vegetation on these sites was trimmed as described earlier.



Figure 6: Photographs taken before and immediately after the construction of a piled vegetation shelf. NB. The water level on the 2nd photograph is low, the shelf is normally submerged as shown on the illustration.

3. Castellated permanent moorings

Aim of the works

Permanent moorings are mostly used by experienced navigators and are not subject to the large number of boat movements that visitor moorings have to cope with, and so this design could be developed to include water vole habitat, erosion protection as well as safe mooring conditions.

The Project applied this design in two locations. Both were situated in locations with water vole habitat, within the centre of a smaller town, in very close vicinity to sections of hard edge bank protection and on the offside of the canal.

Engineering solution / design selected

This design combines moorings with water vole habitat, by alternating sections of below water level piled vegetation shelf with sections of higher piled hard edge. It provides safe platforms for boats to moor against with bays of reed fringes and soft bank, protected from erosion by the line of submerged piles.

Water vole mitigation and methodology - before & during the works
As for the steel sheet piled vegetation shelf.



Figure 7: Photographs taken before and 6 months after the construction of the castellated permanent moorings.

Recovery & development

Water vole habitat is developing at the sites using these solutions. Establishment of the emergent fringe, in particular on the hazel faggot shelf, has been spectacular and water voles as well as other wildlife are benefiting from the protection it provides. Overall, the available habitat has increased as well as been given long term protection.

Post project monitoring

As the Lottery funded Project comes to its end the early indications are positive; habitats are establishing and water vole colonies have been retained and in some cases, such as Sells Green, have increased. However, managing the K&A will always remain a very delicate balancing act between its leisure function and its natural & built heritage and it is recognised that on-going monitoring of both canal use and environmental parameters is important to be able to make informed decisions.

Environmental monitoring, in the form of water quality, water resource and targeted ecological monitoring is already in place and is part of a comprehensive system of simple measurable sustainability indicators being developed. Ecological monitoring focuses on assessment of the plant communities of the canal margins and banks in 12 survey lengths of 1km. These lengths include sections with examples of the designs used in the case studies above, as well as sections unaffected by the restoration project

Detailed botanical data will show habitat development and change and can be related to measurements of recreational use, maintenance activities etc. This approach was chosen as the plant communities support a wide range of canal fauna from dragonfly larvae to breeding birds and provide a cost effective and consistent indicator. Specialist surveys of other taxa will be undertaken as required.

Although it is essential that the habitat is suitable for water voles, without other protective measures this may not be enough. Recently, a controlled trial of mink culling to protect important populations in the Kennet Valley started, in which BW is an active partner.

Conclusion

The water vole habitat improvements made are not only beneficial for water voles, but also provide suitable conditions for other wildlife such as dragonflies, various canal side birds and amphibians. The methods used provide eco-friendly, functional and durable alternatives. Apart from improving water vole habitat, they help to maintain the canal's "green" character for the benefit of canal visitors.

In recognition, the Project has been given the 2001 Award for Engineering in the Natural Environment by the Engineering Council. The Conservation Plan received the Landscape Institute's 2001 Strategic Landscape Planning Award.

Oda Dijksterhuis, ecologist, Kennet and Avon Canal partnership and Viv Phillips, ecologist, British Waterways

Deconstructing EU wildlife legislation, or Observations on Circular 23/2001 (and related documentation) and LPA procedures involved in planning applications

Greg Carson, MIEEM

Background

January 2000 saw a re-interpretation of the provisions of the 'Habitats' Directive¹ (and associated 'Habitats' Regulations, 1994) with regard to the issue of derogation licences for work associated with EU protected species. Prior to this time, CCW/ EN issued licences on the basis that 'conservation gain' resulted from measures taken by developers (often set as conditions or S106 by the Local Planning Authority) on granting of planning permission.

A 'reasoned opinion' issued from DGXI made it clear that any such work related to a development, could only benefit from a licence issued under Article 16(1)(c) (equivalent to Regulation 44(2)(e)). The Regulations currently specify that such licences can only be issued by the National Assembly for Wales/ DEFRA².

An informal guidance note (issued by the NAFW on 4/1/01 - an equivalent was issued in England), clarified the three tests that would be applied with respect to the above Regulation before a licence would be issued:

- that the development was of overriding public interest,
- that there was no satisfactory alternative to the development, and
- that the favourable conservation status of the species would be maintained.

The guidance note stated that it would seek the advice of the LPA on the first two tests, and the advice of the CCW (or EN) on the third. This statement was more or less mirrored in Circular 23/2001 issued on 18/7/01.

The analysis detailed below is not intended to illustrate weaknesses inherent in the legislation per se. Rather it suggests that, as long as any LA follows a 'common sense' approach to issuing a planning consent with appropriate conditions, they are a **long way from contravening any domestic or EU wildlife legislation**.

Interpretation

The change in stance of the licensing regime in early 2000 rang alarm bells in the ears of local authority officers, since there was an assumption that the LA had to directly consider the first two tests prior to considering a planning application. In the words of Andrew Baker "Schedule 2 species have, in effect, been elevated to the centre of planning policy, development and control"³. I have been grappling with this concept for many months now, and have come to the conclusion that the impact of the development licensing regime passing to the NAFW (or DEFRA) may not have such a profound effect on LPA procedures as at first thought. A note which accompanied the above Circular indicated that the NAFW was looking to passing the licensing responsibility to the LA. When this happens, I have

little doubt that the procedural implications will be significant. However, until then, it may be a 'business as usual' scenario, although with a slightly worse deal for wildlife compared to when all licensing was in the hands of the conservation agencies.

The initial starting point is that the Habitats Regulations and Town and Country Planning Acts are two separate pieces of legislation.

The key points drawing together the provisions of these pieces of legislation are:

- Regulation 3(4) requiring that the LPA has regard to the provisions of the Habitats Directive in discharging their duties.
- Circular 23/ 2001 informing LPAs that information they provide will be used by the NAFW in evaluating licence applications.
- The derogation provided in Regulation 40(3)(c).
- The requirements of NAFW/DETR guidance.

Circular 23/2001

Circular 23/2001 states that in consideration of a licence application, the NAFW will seek information from the LPA, and will request from the LPA:

"advice on how the tests specified in article 16(1) of the Habitats Directive and regulation 44 of the 1994 Regulations can be addressed in the case in question. This should include an assessment of the importance attached to the development against the background of national planning policy guidance and development plans, including material considerations."

The second sentence of the above paragraph requires **no more consideration of protected species issues** than would have been necessary prior to the change in the licensing regime. Current planning policy guidance offers no comfort to the development control officer (see below), so the only real guide to what action should be taken would be that specified in (an adopted) development plan.

The question of whether the NAFW expect the LPA themselves to consider directly the licensing tests, prior to determining a planning application, has been put to NAFW. They replied reiterating their own obligations in issuing licences, citing the LAs duty under Reg 3(4) and concluded by saying:

"The implications of that duty for the grant of planning permission where a protected species is likely to be affected is a matter for the local planning authority to consider".

However, the LPA's duty under Reg 3(4) can be fulfilled in other ways (see below). So in the absence of advice to the contrary, it can be assumed that **the LPA does not have to consider the two tests directly**.

Planning guidance

Both NAFW and DEFRA guidance state that "the presence of a protected species is a material consideration ..."⁴. However, although the requirements of domestic and European wildlife legislation are cited, the LPA is given **no explicit advice on what action to take** where a development proposal may affect protected species⁵. The guidance **does** specify that CCW/ EN should be consulted. Where a clear objection is received from either of these bodies, the planning officer is likely to give this due weight in the consideration of the recommendation. However, invariably (in my experience), such objections are rarely forthcoming. It is more likely that comments such as 'no objection, subject to appropriate surveys/ mitigation/ licences' etc. would be received.

Where no outright objection is received from CCW/ EN, like any other material planning consideration, consideration of protected species will be a matter of degree. For example, it may be likely that a LPA would be successfully challenged on a decision to grant planning consent where a pond were to be destroyed which had a 'near exceptional' population of great crested newts, rather than a single breeding pair. However, if the latter were the case, it may **not be unreasonable for a LPA to grant permission subject to condition**. The LPA could take comfort in the fact that for the permission to be legally implemented, a licence would first be required from NAFW/ DEFRA, and that this would only be issued where (amongst the other tests) favourable conservation status could be maintained.

Regulation 3(4)

Regulation 3(4) requires all local planning authorities, in the exercise of all their functions, to have regard to the provisions of the Habitats Directive so far as they might be affected by those functions. **There is no guidance or advice on what this "regard" should constitute**. It could well be that requiring a planning condition for survey and/or mitigation, or even simply consulting the appropriate conservation agency is sufficient "regard" to the provisions of the Directive.

Regulation 40(3)(c)

Regulation 40(3)(c) states that no offence will be committed by "any act made unlawful by [Regulation 39] if [it is shown] that the act was the incidental result of a lawful operation and could not reasonably be avoided"⁶. There are two facets to this derogation. The first is that the act was an incidental result of a lawful operation i.e. a valid planning consent. Granting planning consent is the function of the LPA. Normally the LPA would attach conditions where protected species were (or suspected of being) present (i.e. conforming to Regulation 3(4)...?) which would prevent the likelihood of any detrimental action taking place. However, attaching such a condition **is not a prerequisite for granting a planning permission** and therefore may not be strictly necessary in the context of the first facet of Regulation 40(3)(c).

The second facet of this derogation i.e. that 'reasonable avoidance' is undertaken, is *not* a Town & Country Planning Act issue. **There is nothing which explicitly states that this requirement should be 'enforced' by the LPA** (cf. the requirements related to EU sites in Regulations 47 & 48). Indeed, since such 'avoidance' measures invariably have to be accompanied by a licence, it is the NAFW/ DEFRA which controls whether or not the second facet of this derogation is met. Clearly, the licence will only be forthcoming if the three tests are satisfied. So even if the LPA made an unwise decision where the conditions/ mitigation were insufficient to safeguard the favourable conservation status of a species, any adverse effect on the species **would not be due to any inadequacy of the decision made by the LPA**. In practical terms, this could only occur where a developer implements a valid planning permission without undertaking reasonable avoidance measures (thereby contravening Regulation 39) or undertakes reasonable avoidance measures, but without an appropriate licence (in which case Regulation 44 is contravened). To my knowledge, there is no case law where either of these two scenarios has taken place.

The Cornwall EIA case

Initially, it would seem logical to apply the principles behind the outcome of this case to developments which do not require an EIA. However, in the Cornwall case it was the fact that the information submitted did not comply with the relevant EIA Regs that made the determination of the planning application unlawful, not simply the fact that a planning consent was granted where protected species were subject to conditions. The arguments given

above attempt to demonstrate that, where there is no EIA required, all relevant legislation would be complied with, and hence it would **not** be unlawful to issue a planning permission subject to conditions.

Conclusion

Prior to the change in licensing regime, we operated a system that where a proposed development could have had an adverse impact on protected species, the LPA imposed conditions that ensured that both individuals of protected species were safeguarded *and* that favourable conservation status was maintained by providing mitigation habitat. In addition, to ensure that conservation gain was obtained in order to issue a licence under Regulation 44(2)(a), CCW required *further* conservation measures (not necessarily directly linked to the application site in question). We now appear to have lost this capacity to enhance biodiversity over and above maintaining favourable conservation status, in response to development proposals.

The views above are those of the author and do not necessarily represent the views of Flintshire County Council or its Members

- 1 In this document, I am using an informal approach to the titles of and wording within the legislation
- 2 Cited as the "agriculture Minister"
- 3 "In Practice" (Bulletin of the IEEM, May 2000)
- 4 PG(Wales) - Planning Policy, First Revision (Apr '99); PPG9 (Oct '94)
- 5 It should be noted that the draft revision of Planning Policy Wales (Feb '01), does require the LPA to consider 'overriding public interest' directly "when considering development proposals where the presence of a European protected species is a material consideration". (Para 7.9.2). The draft also suggests that where a site is allocated within (an adopted?) development plan, it is assumed that there is no suitable alternative...! (Para 7.9.3).
- 6 This derogation is not present in the Directive itself. It could be considered that there is a conflict between this Regulation, and Regulation 3(4) which directs us to have regard to the Directive itself, which lacks this derogation. However, because this provision does exist within the Regulations, and internal legal advice states that the LPA should apply the Regulations, not the Directive, this derogation has to be considered valid.

Dr Greg Carson is County Ecologist, Flintshire County Council

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THE IEEM 10th ANNIVERSARY SURVEY FEEDBACK: WHAT IS IEEM TARGETING FOR IMPROVMENT & WHAT YOU CAN DO TO HELP

Mike Barker, MIEEM

Introduction

This paper follows on from the analysis of preliminary results of the survey published in "In Practice" (October 2001). It sets out some of the key messages on levels of service and priorities for action arising from the IEEM membership survey. We have recently discussed these conclusions at Council, and agreed the way forward for priority actions for the Council, the Committees and the Secretariat. To keep you informed, some of the ongoing initiatives are presented here.

Council has over the last year, approved a membership strategy and discussed a marketing plan, which deal with some of the key short-term conclusions drawn from the survey. These existing initiatives will be built on by new actions recently agreed by Council to address some of the key medium/long term membership issues identified. A further point to take into account is the workplan for the Institute, which was set up 2 years ago and based on the responses received from the membership at the time. This is regularly updated as progress is made.

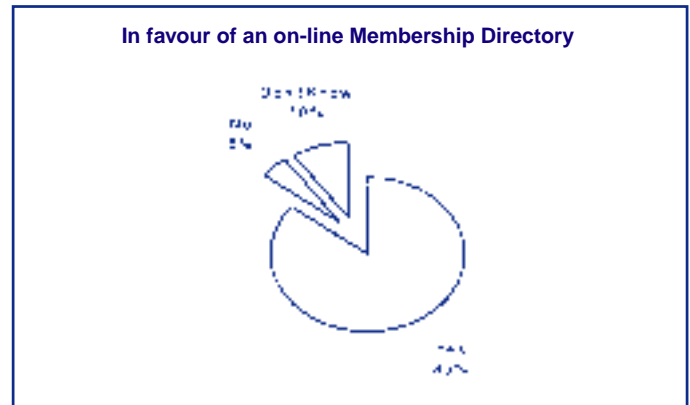
We have also identified a few ways in which individual members can help develop the Institute further. We also hope that as individuals we can "do our bit" for the Institute to ensure that professionals in ecology and environmental management is represented as fully and credibly as possible.

What IEEM is doing Right and which are Key Existing Initiatives

Overall the results of the membership questionnaire show a reasonably positive approach by the IEEM membership to several key aspects. In particular, the overall satisfaction with levels of service/professional representation provided by the Institute was reasonable. However, discussion at the most recent Council meeting confirmed that IEEM should be aiming for a higher approval rating than this from its members.

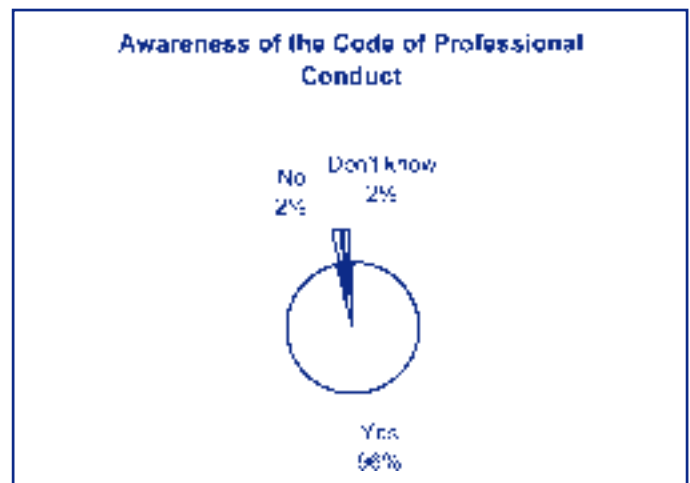


The survey shows resounding support for the idea of an on-line Membership Directory. The design of the directory will take on-board comments regarding searchability, more information/categories and more frequent updates. The on-line directory project is now being scoped and should be launched in late summer 2002.



In Practice is valued by members, the majority of you making significant or regular use of the publication. This element of feedback was discussed in the preliminary results paper in October. In order to improve and expand the journal it is hope to re-establish the In Practice Editorial board based on the substantial number of offers of help in this area.

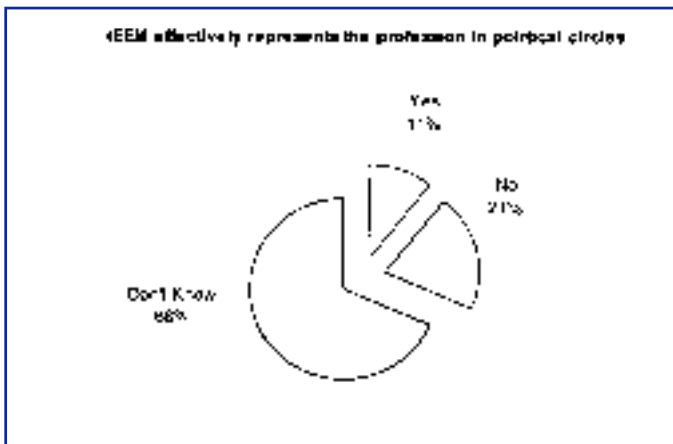
The way IEEM upholds professional standards is broadly effectively according to the results of the survey. In particular, members are comfortable with the standards required for entry to the Institute, which MAC has established and implements. No significant changes to the way new applications are dealt with are therefore proposed. However, portfolio application procedures have been streamlined, as have Fellows applications. This is to facilitate the swifter processing of both sorts of applications. IEEM would particularly welcome more applications for Fellowship.



Key New Initiatives for IEEM

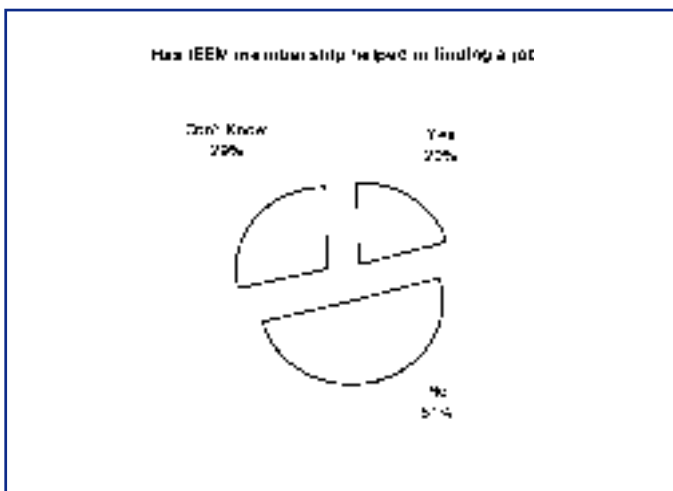
There are a number of key aspects of the Institute that have recently been agreed by Council to enhance further the provision the services already established. The levels of service and value for money aspects are at least partially associated with what business IEEM can physically organise and carry out. Until recently the financial circumstances have restricted the size of our secretariat. Levels of service generally will be helped by a number of current administrative improvements (e.g. database enhancement), and also importantly including the appointment of additional staff in the secretariat.

It is clear from the survey results that the membership is unclear of actions IEEM might take to represent the profession in political circles. Council has recently agreed a revamp of the External Affairs Committee to enhance our representation on external bodies and in appropriate consultation processes. The appointment of nominee members/fellows to be external representatives for IEEM will also assist in raising the overall professional profile.

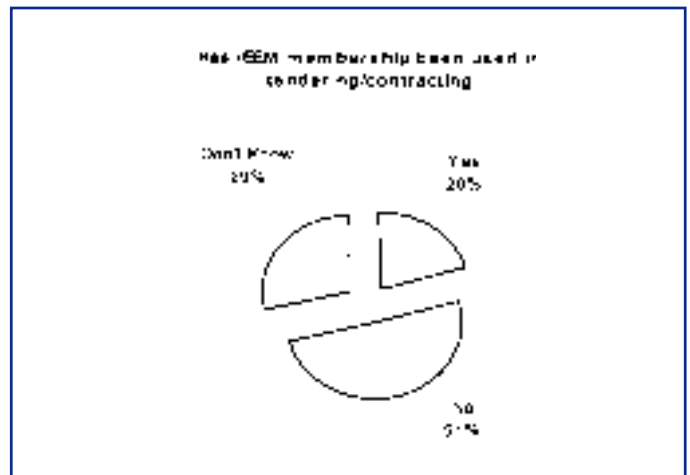


What You can do to Help!

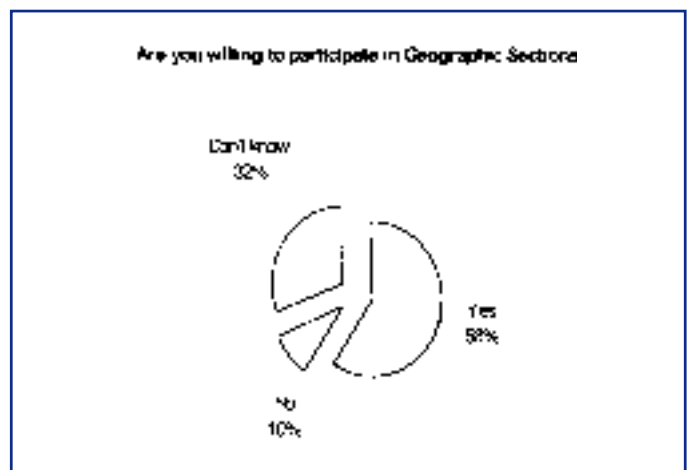
Professional credibility and maintaining professional standards are seen by most members as being the two key functions of the Institute. Yet it was evident that employers are not necessarily asking for IEEM membership nor are you finding that membership is a significant factor in finding jobs or tendering for work. What members in senior positions should be doing more, is making sure that contracting out wording such as “membership of an appropriate Institute, e.g. IEEM” is included in job advertisements and tender documents. This will help raise the profile of the Institute, but more importantly it should help to get you the right contractor/ consultant or employee to do the job.



Geographic Sections have already attracted support in Scotland and the North East of England, and are seen as a good way forward (78% in favour of them; 58% would participate actively). However the sections are currently growing opportunistically. Further expansion would provide local IEEM services and Council has agreed to make the establishment of new Sections a medium term priority, by providing some positive assistance. However, key individual/ small groups of members are essential to co-ordinate the establishment of new geographic sections. If you put your name down as a potential volunteer contact the IEEM office as to the best way forward.



The survey also highlighted a substantial resource in terms of members willing to volunteer for a range of other IEEM activities, like joining one of the committees, helping to run specialist training days or organising the Institute conferences. We are likely to be in touch! If you don't hear from us and are still keen to get involved, give the IEEM office a call – you will get a warm welcome.



Finally, thanks to all of the 430+ members returning questionnaires for the survey. We will be looking to put all results on the IEEM web-site in the near future, so you can all see the summarised responses.

Mike Barker is Environment and Product Quality Team Manager, Southern Water

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.

In the Journals

Compiled by Pat Rae, Peter
Shepherd and
Jim Thompson
Joel Bateman



British Ecological Society

At the request of the BES we are now including an email address for the main author who may be contacted for further information about the paper. The reviews in this edition again fall heavily on the Journal of Applied Ecology since the papers in the Journal of Ecology have recently been particularly difficult to apply to circumstances likely to be of interest to IEEM members.

S.J. Lane, J.C. Alonso and C.A. Martin.

Habitat preferences of great bustard *Otis tarda* flocks in the arable steppes of Central Spain: are potentially suitable areas unoccupied?
Journal of Applied Ecology **38**: 193 - 203.

With a bird the size of the great bustard, research papers have more than a passing interest. It goes without saying that a bird which can weigh up to 18kg is a spectacular sight. It seems that the world population is in the order of 33,200 – 42,800 individuals of which 44-57% occur in Spain. Detailed population trends are known for only a few areas, but general declines are thought to be widespread and consequently great bustards are categorized as a globally threatened species. In the former East Germany, numbers decreased from an estimated 4,100 birds in 1,040 to just 90 in 1995. A similar reduction occurred in Hungary, where an 87% loss during the period 1941 – 1933 left an overall population of 1,100 birds. In Poland, former Yugoslavia and Bulgaria the species may already be extinct. Populations exceeding a few hundred are now rare and probably occur only in Spain and Russia. The causes of these declines and range fragmentation are not fully understood. However advances in arable technology which improve yields at the expense of maintaining traditional practices compatible with bird conservation are considered by many to have played a major role. An understanding of the relationship between land use and the species' habitat requirements is necessary to predict the consequences of land use on this declining species.

A 2-year study of the great bustard substrate preferences was conducted in a large region in central Spain where most cereals are still cultivated in a traditional 2-year rotation. Great bustards showed year – round selection of stubble fields but avoided ploughed and uncultivated areas. Other substrate types were variously selected, avoided or used in proportion to availability depending on season. Human artefacts such as roads, tracks and powerlines were avoided.

Variables correlating with flock locations could not discriminate between occupied and unoccupied but apparently suitable areas of traditionally managed cereal steppe. This suggests that great bustard distribution in central Spain is not limited by inappropriate land use in steppe areas.

The evidence suggests that great bustards show fidelity to sites regardless of the availability of suitable habitat elsewhere. Settlement patterns are probably determined by the presence of conspecifics rather than habitat cues. The result demonstrates the value of integrating observations of habitat use with knowledge of species' behaviour in order to understand distribution more fully.

The authors propose that conservation efforts should be directed towards securing traditional lek sites (male display sites) and make three recommendations: 1. All great bustard lek sites should be identified; 2. Existing EU legislation should be used to protect these and to ensure that compatible land management practices are applied or maintained and 3. research programmes should be conducted that aim to enhance the conservation value of stubble fields rather than simply demonstrate their selection.

For those uninitiated into the ways of the great bustard this paper as a whole makes fascinating reading.

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S.J. Coulson, J.M. Bullock, M.J. Stevenson and R.F. Pywell.

Colonization of grasslands by sown species: dispersal versus microsite limitation in responses to management.

Journal of Applied Ecology **38**: 204 - 216.

The diversification of species-poor grassland is an important topic and has been dealt with at a practical level by a number of IEEM workshops over the years. This paper with no less than 3 authors as members of IEEM tests the approaches under properly controlled experimental conditions. It often requires the introduction of desirable species by sowing seed. Little is known about the factors controlling the spread of introduced species or how these interact with management. The authors investigated whether management affected spread rates of two grassland species by modifying seed dispersal or seedling establishment.

An experiment was set up on a species – poor grassland and the mechanisms controlling spread were studied in *Rhinanthus minor*, an annual with large seeds adapted for wind dispersal and *Leucanthemum vulgare*, a perennial with small seeds with no obvious dispersal adaptations. Three years later *Rhinanthus* had spread further in the hay-cut treatments than in the grazed treatment. *Leucanthemum* spread poorly in all plots with no treatment effects.

Dispersal curves for *Rhinanthus* were much longer in the hay cut treatment than in the grazed treatment because more seed dispersed during hay cutting than before and cutting dispersed seed longer distances. There was no dispersal by grazing animals. Dispersal showed directional effects; seeds travelled further in the prevailing wind direction before the hay cut and in the grazed treatment; dispersal by hay cutting was further in the cut direction than in the opposite direction.

Leucanthemum showed poor dispersal with no treatment effects, except that more seeds were dispersed in the grazed than the hay cut treatment.

The establishment and survival of sown seeds showed no treatment effects for either species.

Management effects on the spread of *Rhinanthus* reflected effects on dispersal rather than establishment. *Leucanthemum* showed poor dispersal but good establishment in all treatments, suggesting its spread may also have been dispersal-limited. *Rhinanthus* was positively affected by hay cutting because it set seed at the time of cutting whereas *Leucanthemum* set seed later and cutting reduced its seed production.

The results indicate that management of grassland to enhance the colonization of sown species might be best targeted at enhancing seed dispersal distance. Hay cutting can do this but must coincide with seed set.

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M.R. Williams, I. Abbott, G.L. Liddelow, C. Vellios, I.B. Wheeler and A.E. Mellican.

Recovery of bird populations after clearfelling of tall open eucalypt forest in Western Australia.

Journal of Applied Ecology, 2001, **38**: 910 – 920.

Increasing concern over the sustainable management of forested landscapes and the extent of forest clearance world-wide has led to a growing interest in the impacts of logging and associated habitat disturbance on biodiversity. This paper describes the recent karri (*Eucalyptus diversicolor*) forest management practices in south-west Western Australia which are to produce a mosaic of age classes, comprising old-growth and regrowth forests protected from future logging, regrowth stands thinned from time to time, and young (<20yr) regrowth stands. Coupes are never more than 400m from mature karri forest. The minimum proportion dominated by the mature and senescent stages will be approximately 40% over the whole forest.

The current study was established to investigate experimentally the impact on bird species of the initial 5 years and the short term 12-14 years after clearfelling. A Restropsective study was also carried out of both clearfelled and naturally regenerated karri stands aged from 0 to 146 years. The authors found that species richness and total abundance of birds declined by 58% and 96%, respectively, in the first year after clearfelling, and 14 years after logging, were still 17% and 55% below levels in adjacent undisturbed forest. One-third of bird species still had significantly reduced abundance 14 years after disturbance ceased, although all affected species made limited use of regenerating forest. Species richness of regrowth reached that of old-growth at 30-50 years and total abundance of all bird species in regrowth was similar to that of old-growth after approximately 70 years. There was a limitation to the study method, namely that it failed to detect declines in abundance of less than 80-90% for most bird species. Therefore effects on uncommon species were not detected. Nevertheless, the present study identified some key impacts of forest clearfelling on bird communities, with implications both for the consequences of clearfelling of forests and the criteria for sustainable forest management. Also the study showed that several bird species offer potential as indicators of the ecological sustainability of karri forest management – those that nest in large hollows in standing live trees (two cockatoo species) and those that have been slow to recolonize immature regrowth karri forests (six species).

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A.T. Jones, M.J. Hayes and N.R. Sackville Hamilton.

The effect of provenance on the performance of *Crataegus monogyna* in hedges.

Journal of Applied Ecology, 2001, **38** : 952 - 962.

This paper deals with what some of us may have wondered about in our forced or otherwise travels past the hedgerows of motorway UK. Are the observable differences in early leaf burst and blossom due to differences between native and non native stock - and if so, does it really matter? The paper deals with hawthorn's own conservation biology rather than discussing the comparative value of native and non-native stock to insect and bird species. The authors planted an experimental hedge consisting of one local ecotype and eight commercial provenances (four British and four continental European). One hedge was planted on an exposed upland site and a second on a sheltered lowland site. Sections of hedge were planted with or without fencing and with or without mulching in all combinations. Growth and thorniness were assessed over 3 years, and phenology and disease over 2 years.

The results show that stock origin does matter, and at several levels, both

scientific and commercial. For details the paper itself should be consulted. It is important to conserve the natural patterns of morphological variation across mainland Europe especially as the taxonomy of the several closely related and interfertile species has yet to be established. Some 80% of the hawthorn material used in the UK horticultural trade in 1997 was from continental Europe – the reasons being costs and supply. The results showed, in short, that locally provenanced material is superior to a broad range of UK and continental commercially available material, whether this is bud burst time, or resistance to mildew, or better performance at high altitude. Therefore there should be closer matching of hawthorn provenance to the planting site. The results also showed, possibly surprisingly, that the current state of the commercial sector is insufficient to enforce the necessary quality controls over the sources of provenance material and its supply to the end user, e.g. there are no “accredited suppliers”. There are other commercial aspects as well. For example, the grant schemes that require “use of native species/material”, will need to be more specific. Contracts for planting and replacements will also need to be more specific and possibly more effectively penalise early stock failure. It would be comforting to think that the outcome of these trials will penetrate the commercial sector in a short timescale. Those ecologists whose work extends into that horticultural/landscape design can help it to do so.

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A. Wolff, J. P. Paul, J. L. Martin and V. Bretagnolle.

The benefits of extensive agriculture to birds: the case of the little bustard.

Journal of Applied Ecology, 2001, **38**: 963 - 975.

There is great concern about the erosion of biodiversity mainly focused on the transformation and the clearing of natural habitats, many managed habitats also have declining species. Traditional agriculture consists of a complex mosaic of habitats, which promotes a vast diversity of species. However modern agriculture is far more intensive and along with changes in land use, biodiversity is thought to be suffering. The little bustard *Tetrax tetrax* is among many birds thought to be declining because of agricultural intensification in Western Europe. In contrast with the situation elsewhere, bustard numbers have greatly increased during the last 50 years in the Crau, southern France, even though its agriculture has developed. It is important to ascertain which features of agricultural development might have supported this population increase.

This paper assesses how breeding male little bustards use habitats of various levels of agricultural intensification, documented historical changes in bustard numbers and agricultural trends in the Crau and comparing them with present patterns of habitat use, to determine how changes in farm landscapes could drive population trends.

Male bustards used natural steppe and extensive agricultural habitats (fallow, grazed crops, legume crops), whereas more intensive agricultural habitats (hay-meadows, grain crops) were little used. Mean densities on extensive agricultural habitats were always high, but densities on steppe varied with landscape composition: densities were low where steppe was dominant in the landscape, but high where steppe and extensive agriculture were mixed.

The data suggests that little bustard population trends in the Crau are driven by the development of extensive agriculture. Extensive agricultural habitats may provide little bustards with resources unavailable or rare in natural steppe. The large declines seen elsewhere

could be reversed within a few decades by restoring extensive agricultural habitats. The potential impact of the Common Agricultural policy may also lead to decline of the bustard populations, with set aside being used to cultivate Oil seed rape for Biodiesel.

This paper deals with several interesting topics and gives an insight into how birds are affected by the intensification of farming methods and the effect European policy may have on farmland bird species in general.

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T. Piersma, A. Koolhaas, A. Dekinga, J. J. Beukema, R. Dekker and K. Essink.
Long-term indirect effects of mechanical cockle-dredging on intertidal bivalve stocks in the Wadden Sea.
 Journal of Applied Ecology, 2001, **38**: 976–990.

There is world-wide concern about the effects of bottom-dredging on benthic communities in soft sediments. Depending on the scale of the fisheries and the local hydrological conditions, the effects on non-target organisms or structures, often responsible for key benthic processes, may also lead to changes in sediment characteristics. Recovery may be slow, with benthic communities substantially changed. In autumn 1988, almost a third of the 50-km² intertidal system around the island of Griend in the western Dutch Wadden Sea was suction-dredged for edible cockles *Cerastoderma edule* and this study assessed subsequent effects. An adjacent area not directly touched by this fishery and an area from which the mussel *Mytilus edulis* beds were removed served as reference areas. For each year of the 11-year study, sediment characteristics, together with the total stock size and settlement densities of *Cerastoderma*, Baltic tellin *Macoma balthica* and soft-shelled clam *Mya arenaria*, were documented before and after the suction-dredging event.

Between 1988 and 1994, median sediment grain size increased while silt was lost from sediments near Griend that were dredged for cockles. The initial sediment characteristics were re-attained by 1996. After the removal of all *Mytilus* and most *Cerastoderma*, the abundance of *Macoma* declined for 8 years. From 1989 to 1998, stocks of *Cerastoderma*, *Macoma* and *Mytilus* did not recover to the 1988 levels, with the loss of *Cerastoderma* and *Macoma* being most pronounced in the area dredged for cockles. Declines of bivalve stocks were caused by particularly low rates of settlement in fished areas until 1996, i.e. 8 years after the dredging. A comparison of settlement in the short (1992–94) and medium term (1996–98) after cockle-dredging in several fished and unfished areas spread over the entire Dutch Wadden Sea, showed a significant negative effect of dredging on subsequent settlement of *Cerastoderma*. *Macoma* also declined, but not significantly. These results contrast with earlier studies (Hall & Harding, 1997, J. Appl. Ecol. **34**, 497–517), and the authors conclude that this is because of the very much larger scale of the present cockling work affecting resettlement capability.

The authors conclude overall that suction-dredging of *Cerastoderma* had long-lasting negative effects on recruitment of bivalves, particularly the target species, in sandy parts of the Wadden Sea basin. Initially, sediment reworking by suction-dredging (especially during autumn storms) probably caused losses of fine silts. Negative feedback processes appeared to follow that prevented the accumulation of fine-grained sediments conducive to bivalve settlement. This is contrary to advice that has been given previously to the Dutch government.

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L. Peacock, T. Hunter, H. Turner and P. Brain.

Does host genotype diversity affect the distribution of insect and disease damage in willow cropping systems?
 Journal of Applied Ecology, 2001, **38**: 1070–1081.

The use of crop mixtures as a non chemical means to control the spread of pests and diseases has mostly been applied to annual crops. The authors applied the same principle to long term perennial crops such as willows (*Salix spp.*) grown in short term rotation coppice. The organisms studied were two of the main causes of yield loss in coppiced willows: Willow rust disease (*Melampsora spp.*) and the chrysomelid beetle (*Phratora vulgatissima*). The rust is sessile and passively dispersed by wind and rain splash and the beetles are highly mobile and actively disperse. In 1998 and 1999 the degree and spatial distribution of damage by *Melampsora spp.* and *Phratora vulgatissima* were studied concurrently in a field trial containing monocultures of willow genotypes with different willow rust and beetle susceptibilities. There were two design mixtures (random or regular) of three or five genotypes.

For both years, there was more rust and beetle damage on plants in monocultures than in mixtures. Results also suggest that spatial design of willow plantations affects rust distribution to a greater extent than it does beetle distribution: In 1998, spatial distribution of rust was aggregated in 67 of plots studied and in 40 for beetles. There was no significant difference in the distribution of beetle damage between planting design, but rust was aggregated in 75 of mixtures and 33 of monocultures.

The authors conclude that plantation design provides the basis for integrated control of rust and beetle damage within willow cropping systems by delaying the spread and development of both organisms. Although possessing quite different dispersal mechanisms, both pest and disease can be assessed successfully and simultaneously under field conditions, a major saving in human resources. Initial selection of willow mixture configuration should primarily take into account the effects of spatial design on rust development.

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M. Brändle and R. Brandl.

Species richness of insects and mites on trees: expanding Southwood.
 Journal of Animal Ecology, 2001, **70**: 491–504.

This paper compared the results reported by Kennedy and Southwood (1984) with data compiled on phytophagous insects and mites associated with 25 tree genera in Germany. The patterns in species-richness in Germany were found to be similar to those reported for Great Britain. The study considered further the three hypotheses proposed by Kennedy and Southwood to explain species-richness. These are the species-area hypothesis, the geological time hypothesis and the taxonomic isolation hypothesis. The authors used present abundance of trees, their distributional range during the Holocene, morphological traits and taxonomic isolation to explain the differences in species-richness across the tree genera. The analysis of the variables used tree genera either as independent data points or to calculate phylogenetically independent contrasts. The authors conclude from their analysis that species-richness of phytophagous insects and mites on tree genera in Germany is positively related to the current abundance of tree species, tree height and abundance derived from pollen records. The authors also concluded that the length of time the tree genus was present in Germany since the last glaciation was also significant. The proportions of specialist species showed a negative relationship with the current abundance of tree genera, but a positive relationship with taxonomic isolation as well as the length of time the genus has been present in Germany since the end of the last glaciation.

The authors suggest that the results support the species-area hypothesis and the taxonomic isolation hypothesis for phytophagous insects and mites on native tree genera. These results demonstrate that the patterns reported by Kennedy and Southwood (1984) also hold true for Germany. The authors conclude therefore the fact that Britain is an island has not biased the analysis undertaken of species-richness of phytophagous organisms in Britain.

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S. Jennings, T.A. Dinmore, D.E. Duplisea, K.J. Warr and J.E. Lancaster.

Trawling disturbance can modify benthic production processes.

Journal of Animal Ecology, 2001, **70**: 459-475.

Long term studies of the benthos of the North Sea indicate that biomass and production have increased. It has been suggested by some that this is a result of trawling disturbance that has boosted production whilst others assume trawling is damaging key functional processes. This large-scale study considered the effects of quantified gradients of the level of trawling disturbance on benthic production in real fishing grounds in the North Sea. Trawling is known to have a wide range of impacts on benthic habitat and community structure. In particular existing theory suggests that it may lead to the proliferation of smaller benthic species with shorter life histories enabling them to survive the mortality imposed by trawling and take advantage of reduced predation and competition from larger species that are depleted by trawling. The authors studied two areas of the North Sea. The Silver Pit area was subject to high levels of trawling disturbance, whereas the Hills area was subject to lower ranges of disturbance. The study described various size structures of benthic fauna and related these to degrees of trawling disturbance. In the Silver Pit area the infaunal biomass and production was significantly decreased. In addition the abundance of larger individuals was depleted to a greater degree than the smaller fauna. In contrast the epifaunal community was not significantly affected. In the Hills area the level of trawling did not have a significant effect on biomass or production. In the Silver Pit area the production per biomass of the infaunal community increased with greater trawling disturbance. This was attributable to the larger proportion of smaller fauna in the disturbed community. The increase in relative production however did not compensate for the reduction in total production. The authors conclude from the study that the increase in biomass and production in small infaunal invertebrates in the North Sea is attributable largely to increases in primary production driven by climate change and not to the impacts of trawling disturbance.

Correspondence: S Jennings, email: S.Jennings@cesas.co.uk

F.W. Kirkham.

Nitrogen uptake and nutrient limitation in six hill moorland species in relation to atmospheric nitrogen deposition in England and Wales.

Journal of Ecology 2001, **89**: 1041- 1053.

Upland areas receive proportionately large amounts of atmospheric nitrogen (N) compared with lowlands. This is partly because levels of precipitation are high in the uplands and ionic concentrations tend to be high in hill cloud and also because these areas are very effective sinks for gaseous emissions, particularly ammonia. Heathlands tend to convert to grassland above a critical load of 15 – 20 kg N ha⁻¹ year⁻¹. Particularly high levels are recorded in the South Pennines and in Cumbria and lower values in north-east England and most of Scotland.

Samples of shoot tissue of six hill moorland species were obtained from upland sites in England and Wales in 1996 and 1997 and analysed for nitrogen (N) content, annual accumulated N per hectare and nitrogen to

phosphorus (N : P) ratio. The species sampled were: *Calluna vulgaris* in four growth phases (pioneer, building, mature and degenerate), *Vaccinium myrtillus*, *Molinia caerulea*, *Nardus stricta*, *Eriophorum vaginatum* and *Agrostis/Festuca*.

None of the plant tissue variables tested was significantly correlated with NH_x deposition and only *Nardus* N : P ratios were correlated with total N deposition. However, for all species except *Nardus*, *Eriophorum* and *Molinia*, shoot N concentration and/or assimilated N per hectare were significantly correlated with NO_x deposition in at least one of the two years, as were N : P ratios for *Calluna*, *Vaccinium* and *Nardus*.

Significant relationships between N deposition and N : P ratios in shoot tissue suggested that this accumulation has changed a substantial proportion of *Calluna*-dominated uplands from N-limited ecosystems into P-limited ones. This could favour species such as *Molinia* that are better adapted to P limitation.

Correspondence: Francis Kirkham, email: francis.kirkham@adas.co.uk

K. Thompson, J. G. Hodgson, J. P. Grime and M.J. W. Burke.

Plant traits and temporal scale: evidence from a 5-year invasion experiment using native species.

Journal of Ecology 2001, **89**: 1054-1060.

The past 10-15 years have seen an unprecedented interest in biological invasions, deriving partly from an increasing realization that, against a background of increasing human population and global climate change, invasive species are likely to become one of the key problems of the coming century.

IEEM held an extremely successful conference on a related subject - Exotic and Invasive Species - Should we be concerned? in Birmingham in 2000. The proceedings have since been published.

A long-term experiment was established in 1990 in which seeds of 54 native species, not originally present in the site were sown into unproductive limestone grassland. The objective was to examine the roles of productivity and disturbance as major factors controlling the invasibility of plant communities, and to identify the functional characteristics of successful invaders in response to different types of invasion opportunity.

After 2 years, invasion was strongly promoted by disturbance and less so by increased fertility. Three years later the cover of invaders had declined over most of the experimental area, and the greatest cover of sown species was where the highest levels of fertility and disturbance coincided. Abundance of invaders was reduced by low soil pH.

The identity and distribution of the successful invaders changed as the early stages of invasion gave way to a later stage of consolidation. After 2 years regenerative traits (seed mass and germination characteristics) were the best predictors of success. After 5 years these traits were unrelated to success of the invaders, the most successful invaders were perennial grasses, and no single trait was a good predictor of invasiveness.

The results were consistent with the hypothesis that invasions are promoted by an increase in the availability of resources, either through addition of extra resources or a reduction in their use by the resident vegetation.

Correspondence: Ken Thompson, email: ken.thompson@sheffield.ac.uk

Observations on Bryophytes and Book Review

Paddy Coker, MIEEM

Crawford, Carol L. (2002) *Bryophytes of Native Woods* A field guide to the common mosses and liverworts of Scotland and Ireland's native woodlands. 2nd Edition. Ayr. The Natural Resource Consultancy.

Free of charge in exchange for an A5 SAE stamped for 110 g.57p to Carol Crawford MIEEM, The Natural Resource Consultancy, 4d New Bridge Street, AYR, KA7 1JX, Scotland.

It isn't very often that I receive a book for review, which is as eye-catchingly good as Carol Crawford's. It has two significant advantages over its rivals – the cover is damp resistant and it costs you about 90p if you send an A5 SAE to her. I should add that the publication of this edition of the book was grant aided by Eamonn Wall and Co. and SNH but a financial contribution will help towards the publishing costs of her next bryophyte project. The author is a forester and ecologist, and her skill and knowledge have been combined to produce a reliable and useful guide for the non-specialist. This is not a book primarily intended for the dedicated bryologist.

The pocket-sized book covers 36 bryophyte species, including 4 sphagna, 29 mosses and 3 liverworts, which were selected as a result of extensive fieldwork in the area, and through an analysis of the data in the NVC woodland volume (Rodwell 1991). It has a very useful glossary and reference/resource list. Each species is given its current scientific name and a 'vernacular name'; my preference is for omitting the latter since few, if any, are commonly used. The introduction is short and to the point, with useful information on collecting and preserving species – most of the identification can be done adequately with a x 10 hand lens. The arrangement of the book is good, consisting of a large habitat/species photograph and smaller close-ups of single stems or leaf arrangements. The text is concise with information for each species colour-coded under seven useful categories:

- Habitats (large scale) where the species is likely to be found,
- NVC codes for woodlands where the species is commonly found,
- Special habitats where it might occur,
- Specialised environments,
- Key Identification Features (with hand lens), colour, branching, leaf shape
- Closely related species
- Species with which it is might be confused.

There is also a two page table listing the most likely bryophytes to be found in Scottish NVC woodland communities which will also be of use elsewhere in the British Isles.

What is so good about it is the excellent quality of the digital photographs and their reproduction. With a copy of this book and Perry (1992) in your pocket, you would be well equipped to add a few correctly named bryophytes to your woodland surveys. There is now no possible excuse! My only significant reservation about the book is that only a few liverworts are described and illustrated, but I understand that a follow-up volume is under consideration.

The habitat and close-up photographs are excellent and should permit a non-specialist to make a good attempt at identification of the more abundant and commoner species. More advanced bryologists might find the book rather too basic but it works well – and not only in northern and western districts but also in southern England.

One of the biggest weaknesses that I have seen in many surveys and assessment documents is the lack of information (accurate or otherwise) on lower plants such as bryophytes which are generally regarded as being of some ecological importance. Upon questioning the authors about these shortcomings, the usual response takes one of two forms. Either the author was unable to find a competent surveyor or the person who did the job hadn't really got much of a clue about what they were looking for.

This problem chiefly arises because the amount of formal training in identification which the majority of environmental/ ecological graduates have received is negligible at present because there are apparently more fashionable matters to be fitted in to the curriculum (or, more likely, there isn't anyone to teach it!). Other strategies are often used – such as the quick flick through an illustrated moss book and a sigh of relief when the puzzled surveyor finds a picture, which vaguely resembles the scrap of material in their hand. These books include Roger Phillips' Guide to Grasses, Ferns, Lichens and Mosses (an over-large book which isn't very handy for field use and of limited use for correct identification); Perry's very useful pocket-sized guide is helpful and so is the sadly out of print Collins Guide by Otto Jahns. There are a number of more advanced identification books for bryophytes and some require a lot of skill, patience and microscope work to determine exactly which species of *Bryum* you have in your survey, or if you are sorting out *Scapania* or *Cephalozia* spp. This book should certainly be of assistance to habitat surveyors and to students carrying out ecological projects. Specialist bryophyte courses are run by the Field Studies Council and Kindrogan Field Centre, and these are well worth attending if you can.

I have a strong suspicion that Carol Crawford's book will stimulate more interest in bryophytes and that once 'hooked', those with an interest in learning more will perhaps be tempted to use Watson's excellent but expensive (£33) text. Her book scores highly in terms of the amount of relevant information and picture quality – Perry's book costs £4 and covers a slightly different selection of 39 species but the majority of the good to excellent photographs are in monochrome which is a slight disadvantage. He includes thumbnail distribution maps and some ecological information but no NVC information (although the appropriate book was published earlier (Rodwell 1991)).

My verdict on this book is a resoundingly positive one and I will be using it on the 'Bryophytes as Indicators' training course in May. Get hold of a copy and a x 10 hand lens and you will see why. If you like it or find it useful, send a donation to Carol!

References

- Jahns, O., 1983 Collins Guide to the Ferns, Mosses and Lichens of Britain and Northern and Central Europe. London, Collins. 0 00219254 3
 Perry, A.R., 1992 Mosses and liverworts of woodland, a guide to the commonest species. Cardiff, National Museum of Wales. 0 7200 0362 8
 Rodwell, J. ed., 1991 British Plant Communities: 1. Woodlands and scrub. Cambridge, CUP. 0 521 23558 8
 Watson, E.V., 1981 British Mosses and Liverworts (3rd edn.) Cambridge, CUP

Details of field meetings and courses in bryophyte identification and ecology can be seen on the British Bryological Society website: (<http://www.britishbryologicalsociety.org.uk>)

Paddy Coker is Principal, Dryas Associates.

Institute News

The 2002 Professional Development Programme

The new programme has been very well received so much so that extra days have been arranged for four courses. If you are thinking about booking a course don't delay - a number of courses are filling rapidly.

IEEM Staff Changes

IEEM is pleased to welcome Mr Joel Bateman as Trainee Executive Officer. Joel recently graduated in environmental science from the University of Southampton. Joel will be helping generally but will be particularly active with the website, IT and related areas especially the external face of the Institute.

Committee Matters

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. So if you were considering volunteering do get your nomination forms signed and sent into the office.

Membership Subscriptions

It is pleasing to report that once again the number of members failing to renew is very small. Unfortunately some members required a good deal of prompting which is very wasteful of the Institute's resources. However there are still a few who it would be nice to hear from.

The IEEM Constitution

Work on this is proceeding steadily but is turning out to require more widespread changes than previously thought. We are hoping to become a registered Charity which itself requires changes in the wording of the Constitution but not really in the spirit of what we do. It will not now be possible to put the proposed revisions to an EGM at the Conference in Birmingham on 11th April but we hope to be able to do so at the next AGM in November.

Continuing Professional Development

The new guidance on CPD has now been produced and circulated to all members. There have been a few questions raised as to what should or should not count and it is the intention that the rules should be interpreted flexibly. Remember that the real purpose is to improve and expand your skills and expertise in an area relevant to your work. If this means acquiring skills not directly related to ecology but which might be necessary for you to expand your role in the organization these may be perfectly acceptable. Examples might include training for public enquiries, presentational skills or a number of management courses. Some members have asked for an electronic version of the record sheet and this will be available shortly.

Themes for Future Conferences

The Institute would like to be in a position of being able to plan ahead much more for its Conferences than has recently been the case. The current structure allows for a general 1-day Meeting which in recent years has been at the Birmingham Botanical Gardens but which might change in the future and a 2-day meeting in various parts of the Country. The 1-day meeting needs less preparation and there is some advantage in ensuring that this is always on a topical theme. The two day meeting perhaps offers more scope for in depth treatment of a particular subject.

Any ideas for future themes and venues would be warmly welcomed. Also each conference needs to be backed up by a small team of members who have particular expertise in the subject and can help with contacts for appropriate speakers.

IEEM Visit to the Channel Tunnel Rail Link, 12th June 2002

The Channel Tunnel Rail Link (CTRL) is the first high speed railway in the UK and Britain's largest construction project. Section 1 of the CTRL is nearing completion, with track laying between the Channel Tunnel and NorthKent due to be completed this summer. Construction of the link has been undertaken to the highest standards of environmental design, management and control and ecological issues have been fully integrated into the project from the outset. An extensive programme of ecological mitigation and compensation measures have been implemented before, during and will continue after the construction works are complete, and a tour of the route to investigate these measures further is being arranged for IEEM members by IEEM member Mick Hall.

The tour will include visits to landbridges, habitats created along the route (including four-year-old woodland created on translocated soils) and will provide an opportunity to find out more about the measures that have been implemented to safeguard protected species. The tour will also include an area in Section 2 of the CTRL where major construction works are still in progress, to identify first hand some of the issues that arise and to demonstrate some of the protection measures that are implemented during works.

The day will be arranged as an addition to the 2002 Professional Development Programme and the cost to members will be £45.00 inclusive of coach hire. Further details available from the Secretariat.

Survey Standards

The Professional Affairs Committee recently considered an issue relating to standards for survey. Although the Institute has no definitive guidelines on this at present, this is a note of caution to members to make it clear what the limitations of the survey may be. These might, for example, be time of year or weather conditions or state of vegetation and possibly others but where these may have affected the quality of the survey and the conclusions that may be drawn, it needs to be made clear in any report. In particular be careful over the significance of not being able to find a particular species on a given occasion. Be very wary of concluding that the species is absent - it may surprise you next time!

Scottish Section

The Scottish Section is currently turning its attention to the recruitment of students and has two days scheduled with this in mind - one at Stirling University and one at Edinburgh. Student membership of IEEM is relatively low and it is good to see this being addressed. A larger meeting is planned for the Autumn and details of this will be available in future editions of *In Practice* or on the website.

Shadow Northeast Section

One of the reasons for holding the next 2-day Conference of the Institute in the Northeast is to launch the section there as a fully fledged section in its own right.

The programme for the rest of this year is as follows:

Kielder Forest and the Border Mires Project

Bill Bolton (Forest Enterprise)

An opportunity to investigate the Life project to improve the quality of a major BAP habitat in the region, raised peat bogs. What have we learnt?

Date: 8th May 2002 Time 1.30pm

Venue: Meet at the picnic site at Stoneheugh

Bats in the Hexham Valley

Dr Veronica Howard (MIEEM)

Bat watching around Prudhoe Castle and the riverside

Please come appropriately dressed to be out in the early evening!

Date 11th Sept 2002 Time 7.00pm

Venue: Tyne Riverside County park visitor centre car park in Prudhoe.

Who's who on the Committees and what do they do ?

Much of the work of the Institute is carried on by the Committees. Many members may well be unaware of who serves on the Committees and the work they do, so this section is an attempt to make the governance of the Institute more open. The key decision making body of the Institute is **Council**. Reporting to Council are a number of Committees which have delegated powers. The administrative year is arranged around three cycles of the Committees culminating in the final Council Meeting shortly before the AGM. So each Committee meets three times a year with the exception of the Membership Admissions Committee which meets four times a year to ensure the smooth running and processing of applications. The Members of Council are elected annually at the AGM but Council does have the power to co-opt should this be necessary. The Chairman of Council is the President and, in his absence, the chair is taken by the Vice President. The purpose of Council is to consider the broader strategy of the Institute and provide guidance to the Secretariat and co-ordinate the activities of the various Committees. As, other than a General Meeting, Council is the only body which can approve changes in the byelaws, it does sometimes become involved in some very detailed issues.

The membership and functions of the Committees are shown below with the Chairmen marked in bold type.

The current members of **Council** are:

Mr Michael	Barker	mike.barker@southernwater.co.uk
Dr Peter	Beale	beale@eclipse.co.uk
Ms Sue	Bell	Sue.Bell@swkeurope.com
Dr Tim	Bines	tim.bines@english-nature.org.uk
Dr John	Box	jbox@wardell-armstrong.com
Professor Tony	Bradshaw	tonybradshaw@cableinet.co.uk
Mr Colin	Buttery	cbuttery@westminster.gov.uk
Dr Robin	Buxton	Robinbuxton@compuserve.com
Dr Nick	Carter	nick.carter@bto.org
Ms Kathy	Dale	kd@northcol.co.uk
Dr Stephen	Gibson	steve.gibson@jncc.gov.uk
Dr David A. Hill	Hill	dhill@ecoscope.co.uk
Mr David	Jamieson	d.jamieson@btcv.org.uk
Ms Hilary	Ludlow	landscicon@tinyworld.co.uk
Mr William	Manley	will.manley@royagcol.ac.uk
Mr Steve	Pullan	Steve.pullan@virgin.net
Dr Alex	Tait	alex.tait@eastsussexcc.gov.uk
Dr Eirene	Williams	ewilliams@plymouth.ac.uk

The **Finance and General Purposes Committee** is chaired by the President and its purpose is to run the administration of the Institute including property maintenance, staff relations, budget planning, book-keeping and audits, to prepare annual reports, to convene Annual and Extraordinary General meetings and to promote development in general of the Institute including fostering Geographic and Special Interest Groups within the membership.

Ms Sue	Bell	Sue.Bell@swkeurope.com
Mr Colin	Buttery	cbuttery@westminster.gov.uk
Mr Daniel	Gotts	DANIEL.GOTTS@SNH.GOV.UK
Dr David A. Hill	Hill	dhill@ecoscope.co.uk
Mr William	Manley	will.manley@royagcol.ac.uk
Mrs Jenny	Neff	info@eacs.iol.ie
Dr Janet	Swan	jswan@rsk.co.uk
Dr Alex	Tait	alex.tait@eastsussexcc.gov.uk

The **Membership Admissions Committee** operates to promote membership of the Institute, vet applications for membership in accordance with the bye-laws, to supervise membership renewal and to prepare the Membership Directory.

Mr Michael Barker	mike.barker@southernwater.co.uk
Dr Patrick Coker	paddy@dryas.freeserve.co.uk
Mr A. Richard Graves	richard.graves@metcalfeddy.co.uk
Mr Kim Harding	harding_k@yahoo.com
Dr David A. Hill	dhill@ecoscope.co.uk
Dr David J. Hill	d.j.hill@bris.ac.uk
Mr Robert Mayhew	Robert.Mayhew@nnpa.org.uk
Dr Albert Nottage	asn@hrwallingford.co.uk
Mr Steven Pullan	s.pullan@frca.maff.gsi.gov.uk
Dr Patricia Rae	patricia.rae@granherne.com
Mr Paul Rooney	rooney@hope.ac.uk

The **Professional Affairs Committee** works to review the Code of Professional Conduct, and the adherence of members to it and reports to Council where it considers there may have been a failure to do so. It also issues other appropriate guidelines on professional practice and keeps members informed of new developments and professional opportunities in the practice of ecology and environmental management.

Mr Nicholas Baxter	nick.baxter@surreycc.gov.uk
Dr Tim Bines	tim.bines@english-nature.org.uk
Mr Paul Bradley	pba@tinyworld.co.uk
Dr Stephen Gibson	steve.gibson@jncc.gov.uk
Ms Jacqui Green	gecco@flexnet.co.uk
Dr David A. Hill	dhill@ecoscope.co.uk
Dr Tom Keatley	T.keatley@defra.gsi.gov.uk
Mr Martyn Kelly	Bowburn_Consultancy@compuserve.com
Mr Mark Lang	markLang@wiltshirewildlife.org
Ms Hilary Ludlow	landscicon@tinyworld.co.uk
Dr Sue Swales	sue.swales@bromley.gov.uk
Dr Peter Shepherd	bsg@dial.pipex.com
Dr Michael Wells	Michael.Wells@npaconsult.co.uk
Dr Eirene Williams	ewilliams@plymouth.ac.uk

The **Training, Education and Career Development Committee** has the purpose of ensuring that adequate opportunities exist at all levels of education (academic) and vocational for helping those who wish it to obtain suitable qualifications for admissions to IEEM, and to develop a system of training for IEEM members which can be subject to periodic review for membership competence and upgrading.

Dr Peter Beale	beale@eclipse.co.uk
Ms Elizabeth Biron	somerc@compuserve.com
Dr Robin Buxton	robinbuxton@compuserve.com
Dr Patrick Coker	paddy@dryas.freeserve.co.uk
Mr Simon Davey	srdavey@globalnet.co.uk
Dr David A. Hill	dhill@ecoscope.co.uk
Mr Stewart Lowther	stewartlowther@casella.co.uk
Ms Pamela Nolan	pam.nolan.@environment-agency.gov.uk
Mr Peter Phillipson	Peter@telltale.Co.UK
Dr John Rose	j.c.rose@shu.ac.uk

The purpose of the **External Affairs Committee** is to liaise with appropriate bodies, both within the UK and Abroad, especially in the European Community, monitoring external issues relevant to the Institute, in particular implications for the profession, and to represent the considered opinion of the Institute about these to private, government bodies and the general public. The Chair of the Committee is the Vice President, Dr Alex Tait. The structure of this Committee is under review and it currently does not meet on a regular basis but, under the Chairman, is the main means of contact with other Institutions and the discussions over the possibilities for closer working which are now taking place.

The Committee of the **Scottish Section** considers all matters as they relate to the activities of the Institute in Scotland. The Scottish Committee is represented on Council through David Jamieson, the Convenor and Kathy Dale, the vice-Convenor and on the Finance and General Purposes Committee through Daniel Gotts. The Secretary is Christine Welsh.

Ms Elaine	Cameron	dagleishassociates@btinternet.com
Mr Alister	Clunas	a.clunas@nts.org.uk
Ms Katharine	Dale	kd@northeacol.co.uk
Ms Julie	Dewar	j.dewar@edin-city-dev.demon.co.uk
Mr Daniel	Gotts	daniel.gotts@snh.gov.uk
Mr Kim	Harding	hardingnrs.guest1@forestry.gsi.gov.uk
Mr David	Jamieson	d.jamieson@btcv.org.uk
Ms Caitlin	McFarland	2caitlin@tiscali.co.uk
Mr Neil	Redgate	consultancy@ndres.co.uk
Miss Christine	Welsh	christine.welsh@snh.gov.uk

There is currently a shadow committee in the North-east of England and initial discussions on the formation of a shadow committee in the North-west.

There is a call made annually for members to participate in Committees and following this, those who have expressed an interest may be approached. Although there is no constitutionally prescribed size for the Committees, most work best at about 10-12. This virtually ensures that each meeting will be quorate (3 members are needed) but it does also mean that sometimes there are not opportunities for the members to join. In addition most of the Committees like to maintain a broad range of professional expertise so that there is usually enough expertise on hand to be able to deal with most issues. This may mean that one person may be selected in preference to another as a means of preserving or enhancing the balance of a Committee.

The Committees do tend to have very full agendas and there is usually no shortage of matters to consider - most Membership Admission Committees last over 4 hours, a reflection of the large number of applicants currently being processed. There may still be time to recover in the bar afterwards!

The purpose of publishing this information about the Committees is to encourage better communication between the membership at large and the Committees and to encourage all members who are concerned about particular issues to raise them either with the Secretariat or the Chairman of the Committee concerned. If you feel that the Institute is not providing a

sufficient service in a particular field do please let your opinions be known. Also it will be helpful for the Institute to gauge the strength on feeling on particular issues if more comments and feedback is given. This is why we have given the email addresses of all Committee members. These in fact will also appear in the new Membership Directory but it was felt that, in this more accessible form, communication within the Institute might be improved.

For purposes of simplicity I have paraphrased the words used to describe the functions of the Committee in the Constitution. In fact most of the Committees interpret their roles quite broadly and deal with most issues within the spirit of their remit. As part of the exercise in going for charitable status there are likely to be a number of detailed changes required to the Constitution. As some of these may be in the Memorandum and Articles of Association, any changes will require the approval of a General Meeting. This could also be an opportunity to update the roles of the Committees. It is unlikely that an Extraordinary General Meeting will be called but that a revised Constitution will be put to the Membership at the AGM in November. At the moment there is no intention to alter fundamentally the underlying purposes of the Institute which remain in many ways just as valid as they were 10 years ago.

The dates of the Committee Meetings in 2002 are:

- Council: 16th July, 24th October
- F&GP: 2nd July, 8th October
- MAC: 18th June, 10th September
- PAC: 9th May, 19th September
- TECD: 20th June, 3rd October
- External Affairs: to be arranged
- Scottish Section: 10th april

Please note that the dates of Committee meetings are sometimes changed.

Some of the key items of work currently under discussion are:

- The programme for the Autumn Conference
- Revisions of the Constitution with a view to obtaining charitable status
- Discussions with other Institutions
- Operation of CPD
- Increasing the Professional Issues Series
- Marketing the Institute
- Meeting the needs of members
- Developing further Geographic Sections
- European initiatives
- Increasing the number of members
- Publication of recent proceedings
- Improving the financial base of the Institute
- Preparation of the new Member's Directory

There is an overall programme for the Institute and monitoring of progress in meeting targets in the programme is undertaken by the Finance and General Purposes Committee.

Working Together for the Countryside

Peter Beale, MIEEM

The Countryside Management Association was formed as the Association of Countryside Rangers in 1966. I joined the ACR in the late 1970s as an associate (as a trainer rather than as a ranger) and have maintained my membership since then. I see the role of IEEM and CMA as being entirely complementary. I, like a number of our members, am already working together with colleagues in the CMA.

I believe there are a number of ways in which we can work together and we have already started this process by agreeing to circulate information about training programmes and conferences in each other's magazines. Copies of IEEM's Professional Development Programme for 2002, will go out with the Ranger magazine in March 2002. We have agreed to publish a digest of what CMA is, and what it does; this appears below. There are flourishing CMA branches in the South West, South East, Home Counties and East Anglia, Midlands, Northern England and in Wales. The current membership stands at 652, of which 17 are corporate members. IEEM is in discussion with other Institutes about ways in which we can work together, so I hope we can add CMA to these consultations.

Peter Beale, Chairman, Training, Education and Career Development Committee.

The CMA was formed to provide a network between rangers and other countryside managers for the exchange of ideas, information and best practice. The organisation is now the largest of its kind in England and Wales for countryside and urban greenspace management professionals. CMA's principle aims are to work regionally, nationally and internationally to:

- Be an effective and professional membership organisation offering a structure for CPD;
- Promote professional and sustainable management of the countryside and urban greenspace;
- Inform the decision making process;
- Provide information, training and comment on relevant issues.

CMA seeks to achieve these in a variety of ways including; the Association's Magazines; training events; website, notice board and 'e'group; providing advice and comment on countryside and urban greenspace management issues; and helping to develop and influence future policy through representation on national fora.

The current membership includes rangers, wardens, managers, project and rights of way officers; working for a variety of organisations and in a variety of locations; dealing with the vast range of practical, management and policy issues that arise from the interactions between visitors, communities, landscape, wildlife and heritage.

Through its members, CMA has access to a huge wealth of knowledge and experience. Through its own initiatives and, just as importantly, through partnership and joint working with others, CMA will continue to seek to ensure that this is used to best effect.

David Perkins, Chair, CMA, Writtle College, Chelmsford, Essex, CM1 3RR
Tel: 01245 424263 Fax: 01245 420456
Email: CMA@writtle.ac.uk or www.countrysidemanagement.org.uk



Entec Ltd is a leading environmental and ecological management consultancy with a proven track record in providing a wide range of services to clients in the public and private sectors. We are currently seeking experienced professionals to join our team in the following roles:

For further information on any of the above roles, please contact our HR Manager, Jennifer Pugh, on 01245 424263 or email entec@writtle.ac.uk. Applications should be sent to the HR Manager, Entec Ltd, Writtle College, Writtle, Chelmsford, Essex, CM1 3RR.

Principal/Senior Consultant - Ecologists

Entec Ltd is currently seeking experienced ecologists to join our team in the following roles: Principal Ecologist, Senior Ecologist, Ecologist. The successful candidate will be responsible for the design and implementation of ecological surveys, assessments and management plans. They will also be responsible for the preparation of reports and the provision of advice to clients.

Consultant - Hydro-Ecologist

Entec Ltd is currently seeking an experienced hydro-ecologist to join our team. The successful candidate will be responsible for the design and implementation of hydro-ecological surveys, assessments and management plans. They will also be responsible for the preparation of reports and the provision of advice to clients.

Consultant/Assistant Consultant - Ecologist

Entec Ltd is currently seeking experienced ecologists to join our team in the following roles: Consultant Ecologist, Assistant Consultant Ecologist. The successful candidate will be responsible for the design and implementation of ecological surveys, assessments and management plans. They will also be responsible for the preparation of reports and the provision of advice to clients.

Closing date: 15th April 2002

Entec Ltd is a leading environmental and ecological management consultancy with a proven track record in providing a wide range of services to clients in the public and private sectors. We are currently seeking experienced professionals to join our team in the following roles:

Recent Publications

Agroecological Innovations - Increasing food Production with Participatory Development
Norman Uphoff (editor)
Earthscan Publications Ltd, London
ISBN 1-85383-857 8, £18.95

This is another useful book from Earthscan which presents the operational means for implementing a more environmentally friendly and socially desirable agricultural system whilst at the same time increasing yields. Documented in 12 case studies, these approaches draw upon greater knowledge, skill and labour input, rather than on larger, unsustainable capital expenditure, and are shown to increase yield substantially, sometimes doubling or tripling output.

The book is arranged in 3 parts - Issues for Analysis and Innovation, Experiences from Africa, Latin America and Asia and advancing agroecological agriculture with participatory practices. There are 22 chapters of which 11 fall into the 2nd part. In Africa there are reports from Kenya, Nigeria, Zambia, Malawi, Senegal, Mali and Madagascar; In Latin America there are chapters on hill-side agriculture, smallholding in the Andes and from Brazil; In Asia there are reports from Bangladesh, Sri Lanka and the Phillipines.

Tolley's Environmental Taxes Handbook 2001 - 2002
Penny Hamilton

LexisNexis ISBN 0 406 98879 X

This publication might well have been titled encyclopaedia for in its 856 pages it contains an absolute wealth of information on Environmental Taxes. The book deals in great detail with the Landfill Tax, the Climate Change Levy and the Aggregates Levy. Each section is divided into the Statutes, dealing with the Main acts and other related acts, the Statutory Instruments and any Appendices. The book is aimed at lawyers, tax advisers, accountants, waste managers and construction companies. At £65.00 this is not cheap, but for the specialist in any of these fields it is probably money very well spent.

Human Ecology: Basic Concepts for Sustainable Development
Gerald G Marten

Earthscan Publications Ltd, London Paperback
ISBN 1-85383-714 8, £14.95

This is another useful volume from Earthscan Publications. The contents are:

Introduction; Populations and Feedback systems; Human population; Ecosystems and social systems as complex adaptive systems; ecosystem organization; ecological succession; coevolution and coadaptation of human social systems and ecosystems; ecosystem services; perceptions of nature; unsustainable human-ecosystem interaction; sustainable human-ecosystem interaction; examples of ecologically sustainable development.

The book is full of examples that are easy to relate to and each chapter has a useful ending with a box on 'things to think about'.

Hidden Beneath the Tides
UK Marine Special Areas of Conservation
ISBN 1 85716 579 9

This attractively presented book is a celebration of the riches around the shores and seas of the British Isles. It comes at the end of the UK Marine SACs Project and Marine Life. The book is presented in popular style but it has solid content. Under the Habitats Directive, some 70 Marine Special Areas of Conservation have now been selected by the Agencies and there are illustrations of a number of the important and unusual organisms to be found.

Available at no cost from:

English Nature, Northminster House, Peterborough PE1 1UA.

Conservation, Access and Recreation 2000 - 2001 Report - The Environment Agency

This annual report from the Environment Agency contains quite a wealth of information and illustrates again a truly impressive range of activities. It starts with the overall national picture and then goes on to highlight particular achievements in the regions. It then deals with particular themes: Conservation, Access and Recreation, Access for all, Research and Development, Enhancing Biodiversity, River Re-engineering and Habitat Creation and Managing Landscapes. The section on enhancing biodiversity deals with otter road deaths in Wales, a study of non-commercial fish species in Cornwall Area Rivers, Crayfish Habitat Improvement, a Local Agenda 21 Community Project, Bourn Brook, Cambridgeshire - Habitat and landscape enhancement, and the Pevensey Levels restoration project.

Available from: The Environment Agency, Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD.

Tel: 01454 624 400. www.environment-agency.gov.uk

Countryside Recreation 9 (3/4) Spring 2001

This is the regular publication of the Countryside Recreation Network, the purpose of which is 'Exchanging and Spreading Information to develop best Policy and Practice in Countryside Recreation'. This edition features the effects of the Foot and Mouth Disease Outbreak and it is an interesting attempt to put the issues into a wider perspective. There are articles on Rural Change and the Impact of FMD, A personal Perspective from Galloway, South West Scotland, FMD - its effects on Open-air Recreation in Scotland, The impact of FMD on the Youth Hostels Association, The impact of FMD on three recreation providers in Northern Ireland, Time to start Walking again and Overlooking the importance of Countryside Recreation - who is to blame?

Contact: Emma Barratt, Network Manager, Department of City and Regional Planning, Cardiff University, Glamorgan Building, King Edward VII Avenue, Cardiff, CF10 3WA. Tel: 029 2087 4970, Fax: 029 2087 4728,

Email: cm@cf.ac.uk

Climate Change: Impacts on UK Forests
Mark Broadmeadow (ed.) Forestry Commission Bulletin 125
ISBN 0 85538 554 5

This is a very timely and useful publication - jointly with the Institute of Chartered Foresters. It is divided into three sections: background, climate change impacts and predictions and responses. It is preceded by summaries in French, German and Welsh. The book is well laid out with excellent photographs, diagrams and tables and each chapter has a substantial bibliography. The thirteen chapters are:

Global climate change: setting the context

The changing climate of the UK: now and in the future

Climate change and damage to trees caused by extremes of temperature

Climate change impacts: storms

Implications of climate change: soil and water

Climate change and the seasonality of woodland flora and fauna

Effects of climate change on fungal diseases of trees

Climate change: implications for forest insect pests

Impacts of increased CO₂ concentrations on tree growth and function

Impacts of climate change on Forest growth

Modelling the future climatic suitability of plantation forest tree species

Impacts on the distribution of plant species found in native beech woodland

Challenges ahead: how should the Forestry sector respond?

The final chapter is an ICF position statement on climate change.

At £25.00 for those with an interest in this subject, it is an excellent buy.

Wetland Website Launched

The new website (www.waterpolicyteam.org) provides information on wetland sites through out the UK. It provides opportunities for getting your feet wet with volunteer conservation and membership of a conservation organisation. The website stresses the importance of wetlands and their species and has a variety of downloads including fact sheets on species such as the great crested newt among many others. The website is part of the Wildlife Trusts' Wetland information service run by its Water Policy Team.

Pat on the back

The Environment Agency survey shows significant improvement in the quality of rivers and estuaries in England and Wales. The quality of the rivers and estuaries today are perhaps the best they have been since the start of the industrial revolution in the late 18th century. Not only this but the quality of our bathing waters are the best they have been since monitoring began in 1988.

The latest survey by the Environment Agency shows a marked improvement in the chemical quality since 1990 with 94% of the rivers and 96% of estuaries classified as good or fair in 2000, compared with 85% and 90% consecutively in 1990. Furthermore 98% of the 481 designated beaches reached British standards for water quality and 60% complied with the far more stringent European Commission Guideline standard.

For details on bathing water quality or any information on the surveys visit the Environment Agency's web site www.environment-agency.gov.uk

Could models benefit wildlife?

The impact of climate change on wildlife

A major programme of research is under way to establish the impact of climate change on wildlife and nature conservation. With strong scientific consensus that the global average temperatures could rise by approximately 1.5 and 5 degrees Centigrade during this century key impacts needed to be assessed and their effects on wildlife habitats. Modelling Natural Resource Responses to Climate Change (MONARCH) is a joint venture of many organisations including English Nature and the Countryside Council for Wales.

The MONARCH project has been broken into two major stages, the first of which has now been completed. Dr Mike Harley the coordinator of the organisations involved in this climate study describes the primary stage of the project: "The core of this work was a study that models how natural resources would react to predicted climate change in 2020 and 2050 using powerful computer modelling. From these models we can look at where suitable climate areas will exist for wildlife in the future, and assess the potential "winners and losers" of climate change". A summary of the initial finds was presented to the Countryside Council for Wales on the 29th January 2002.

The next phase of the MONARCH project will be to address gaps in research knowledge. The models will be down scaled and used at a local level to find out the potential impacts at particular sites. Simon Bareham, CCW senior pollution and climate change advisor commented: "In Wales we hope to look in much more detail at an area such as Snowdonia where we can assess and monitor what effect climate change has on local land use patterns... this will give us lots of important local information, that will ensure that we can take timely action to protect threatened wildlife as the climate changes."

Further details are available from the UK Climate Impacts Programme at Union House, 12 St Michael's Street, Oxford, OX1 2DU or www.ukcip.org.uk

Birthday celebrations for species recovery

English Nature held an anniversary conference in December celebrating the first ten years of its species recovery programme (SRP). SRP began in 1991 with just 13 species and a small budget of £130,000. In the ten years since then this has grown to over 400 species and a budget of £1.2 million.

The shift from pure preservation to species introductions and the re-creation of new habitats was an important change to conservation methods used by this programme. Moreover it has addressed many other issues including tourism pressure and landscape management on top of the promotion of Biodiversity. The scheme has been a great success summed up well by Keith Duff; English Nature's Chief Scientist "Although it has been running for ten years the SRP has really only just started... Lets continue and see how much we can achieve in the next ten years".

Environmentalists rebuke tactics of conservation groups

Friends of the Earth (FOE) Cymru have criticised conservation groups that have called for public inquiry after the council strongly voted in favour of the Cefn Croes wind farm. The site was given the go ahead by Ceredigion council after much public debate. One of the pressure groups, CPRW, suggests that there are many other places that wind farms can be set up. However FOE Cymru energy spokesman Neil Crumpton responded, "The public want to do their bit to tackle damaging climate change and support the battered rural economy. Wind farms do both, generating cheap, clean, safe electricity from thin air, and rent and rates for the region". The debate continues...

Chippenham Fen

English Nature has recently released a video about their National Nature Reserve (NNR) of Chippenham Fen, a site north of Cambridge. The video is about the wildlife and the management techniques used to maintain the community. The video contains interviews with members of English Nature, local volunteers and local members of the community. There is some beautiful wildlife footage of a variety of mammals, birds, insects as well as plants and trees. This video is a good introduction to the methods of conservation that English Nature uses at Chippenham Fen including control of water levels for a network of dykes and the use of a small herd of water buffalo to control grass.

IEEM members can get free copy of this 20-minute video from English Nature publication distributor, Two Ten Productions, 08701214178 or email english-nature@twoten.press.net

Investing in Nature

Financial service giants HSBC announced in February that they are to invest US\$50 million in an eco-partnership of Botanical Gardens Conservation International, Earthwatch and the World Wide Fund for Nature. This is a collaboration which over five years will create conservation projects all over the world. US\$18.4 million is being used to "resuscitate" three of the world's largest rivers; the Amazon in Brazil, the Yangtze in China and the Rio Grande in the US itself. The aim is to restore 2 million hectares of the river basin habitats. US\$11.6 million is being donated to the BGCI to help protect 20,000 endangered species of plant and create a "Noah's Ark" of these species.

For further information go to www.investinginnature.org/

Countryside (UK North America) Exchange

The Countryside Exchange has a unique international programme. It brings together small teams of professionals and volunteers to undertake case studies in rural areas confronting change. This is an exciting opportunity to manage change in the countryside, building links between communities, agencies and teams.

If you have a case study proposal contact John Chapman or Phil Dagnall on 0161 975 6140 or cei@cei-associates.org

Minister launches celebrations of Scotland's most remarkable trees

A project to celebrate Scotland's heritage of trees was launched by Scottish Forestry Minister Allan Wilson. Heritage Trees of Scotland aims to: identify 100 great Heritage Trees of Scotland; record their details and create a valuable inventory; celebrate their legacy and promote them to the people of Scotland and visitors. Trees that qualify could have any number of attributes. For example it might be old, huge size, a rare species or closely associated with history. There are many already know fascinating trees in Scotland; the 65 meter Douglas fir at Hermitage in Perthshire, the Fortingall Yew in Perthshire an ancient tree and The Wallace Yew in Elderslie. The Photo is of a Yew in Ormiston, East Lothian It is thought to be 1000 years old.



Further information: www.treefestscotland2002.org.uk

26 Named winners are to receive £3 million funding for worldwide biodiversity

The Government has awarded £3million to support 26 projects that will help sustain the biodiversity, as part of the tenth round of the Darwin Initiative for the survival of the species.

There are many rare species that will benefit from the Darwin Initiative including axolotl a small amphibian salamander in its last Mexican habitat. Michael Meacher the Environment Minister believes that the project is value for money and will produce positive results. Some of the successes of the Darwin Initiative will be shown at the World Summit in Johannesburg later this year.

For further information visit Defra on www.defra.gov.uk

The end of the New Renaissance Group

The New Renaissance Groups have had many successes; remarkable lectures, advisors to the Government on UK sustainable development strategy and the books Where Next and Beyond sustainable development. The Conservation Foundation has taken over all of the residual interests and assets. So we say fare well to an organisation that had such a holistic goal.

For further information email: conservef@gn.apc.org

The Kite Centre and Museum celebrate

The Kite Centre and Museum at Tregaron will become a treasure trove of information with exhibitions on the red kite. There will be a mock Victorian school and all manor of interesting facts about the history of Tregaron. The Centre and museum have collaborated with local schools to create models and a large land art collage. This was all made possible with the support of the Countryside Council for Wales.

For further information contact Jo Lewis, Kite Centre and Museum on 01974 298977

The largest ever waterways investment

The largest waterway restoration programme with a value of over £500 million has been unveiled by British Waterways. It is a two-stage programme covering 300 miles of canal and waterway structures to be restored or completely rebuilt.

The first phase is to open 220 miles of canals and structures this should be completed this year. Exciting projects such as the Falkirk Wheel, the worlds first rotating boat lift which is to open in May, the Anderton Boat lift, an ancient monument and the forerunner to all other such lifts in the world and the Foxton Inclined Plane, the only inclined plane on a navigable waterway in Britain.

9 further canal restorations and new waterway systems covering 100 miles are to be built in conjunction with The Waterways Trust. This is an exciting time for British Waterways there has not been this kind of investment in the navigable water system since they catalysed the economic boom in the 18th Century. It looks like they are set to do it again. British Waterways is hoping these developments will deliver £100 million for local economies and create 13,000 jobs.

For further information contact Vanesse Wiggins on 01923 201361

EA reports 36,000 pollution incidents

Over 36,000 pollution incidents in England and Wales in 2000 have been published in a report by the Environment Agency. In 2000 the EA responded to 46,840 reports of pollution and 36,406 were substantiated . The number of category 1 (the most environmentally damaging) fell by nearly 15% to only 77 cases. The EA was successful in prosecuting those responsible for 661 incidents.

For further information www.environment-agency.gov.uk

Going native?

**Local Seeds for Local Needs
Training Programme**

Growing wildflowers; Meadow harvesting;
Enhancing species-poor grassland;
Establishing woodland ground flora;
Tree planting: good practice;
Creative conservation in town

To see the full programme and lots of other
information on growing, harvesting and
using native flora, visit

www.floralocale.org

E-mail: floralocale@ntlworld.com

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 1st May 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		F=Full A=Associate Category applied for	
Mr	Damian Aubrey		A
Mrs	Sharon Bayne		F
Mr	Craig Bullock		F
Mr	Philip D. Clark		F
Mr	Matthew Clegg		A
Mr	Iain N. Corbyn		F
Mrs	Stephanie V. Craner		A
Mr	Jonathan R. Cranfield		A
Mr	Ian J. Crowe		F
Mrs	Helen d'Ayala		F
Miss	Milena A. de Jongh		F
Mr	Charles Dewhurst		F
Miss	Kathryn J. Doughty		F
Mr	Neville Drummond Makan		F
Mr	Richard C. Dyer		F
Mr	Nigel T. Dykes		F
Miss	Helen L. Eastman		A
Miss	Celina Gio-Batta		A
Mr	Phil Green		F
Mr	Andrew L. Harrison		A
Mr	Kevin Harrington		A
Dr	Jonathan H.R. Heuch		F
Miss	Pamela Hill		A
Miss	Caroline Hillier		A
Mr	Stephen Holloway		F
Mr	Malte Iden		A
Mr	Mark Jackson		A
Mr	David A. Jones		F
Mr	Mark Jones		F
Mr	Scott M. Knowles		A
Mr	Nick W. Lutt		F
Miss	Louise C. Mapstone		A
Mr	Ryan Mellor		F
Mr	Phillip L. Morgan		F
Mr	John D. Moorcroft		F
Ms	Linda Moore		F
Mr	Peter Oakenfull		A
Mr	Tim Palmer		A
Miss	Anita Parry		F
Miss	Gale A. Pearson		F
Dr	Ellen Pisolkar		F
Mr	David J. Pollard		A
Miss	Beverley K. Rhodes		A
Dr	Robert Rowlands		A
Mr	Stuart A. Shaw		F
Mr	Jan Skuriat		A
Mr	Jonathan A. Smith		F
Ms	Caroline E. Steel		F
Mr	Robin Stephan		A
Miss	Julie Stubbs		A
Mrs	Mary J. Trump		F
Dr	Alexandra C. van der Sleson		F
Miss	Sarah M. Wallbank		F
Mr	Richard Wardle		A
Ms	Clare L. Williams		A
Ms	Juliette K. Young		A

New Admissions to IEEM

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

Name		Grade admitted	
Admitted			
Mr	James	Adkins	F
Dr	Elizabeth	Allchin	F
Mr	William H.	Bond	A
Mrs	Karen	Edwards	F
Ms	Emma	Goldberg	A
Miss	Catherine E.	Grundy	F
Mr	Neil	Guthrie	F
Miss	Rachel	Hayward	F
Ms	Viki	Hirst	F
Mr	David	Hughes	A
Ms	Helen F.	Lancaster	F
Dr	Scot	Mathieson	F
Mr	James	McDougall	F
Dr	Ian	Milne	F
Mrs	Morag A.	Milne	F
Miss	Sally C.	Monks	A
Miss	Katy	Morris	A
Miss	Sharon	Pilkington	A
Miss	Victoria	Price	A
Ms	Elizabeth	Power	F
Mr	John B.	Ratcliffe	F
Mr	Malcolm	Robertson	F
Ms	Gillie	Sargent	F
Mrs	Judith	Sauter	F
Dr	Jacqueline	Trigwell	F
Miss	Sarah	Thompson	F
Miss	Julie	Tuck	A
Miss	Alison J	Williamson	F
Mr	Richard	Wilson	A

Upgrades

The following have successfully upgraded their membership from Associate to Full

Dr	Dolores	Byrne	F
Mr	Paul	Cantwell	F
Mr	Alistair	Church	F
Ms	Alison	Fure	F
Mr	Neil	Harwood	F
Mr	Matthew	Hopkins	F
Miss	Iona	King	F
Mr	Michael	Padfield	F
Mrs	Alison	Strange	F

Students

IEEM is pleased to welcome the following as new student members:

Mrs	Elizabeth	Baldwin	Mr	Michael	McCartney
Mr	Andrew	Batham	Miss	Elaine	McClymont
Miss	Victoria E.	Blake	Miss	Caitlin	McFarland
Miss	Catriona	Conroy	Mr	Roderick	McKee
Mr	Berry C.	Embling	Mr	Daniel	Millan
Miss	Alice K.	Harding	Mr	Grahm	G. O'Mahoney
Miss	Jane A.	Hart	Miss	Clare E.	Pugh
Miss	Melanie C.	Knight	Mr	Stewart	Storrie
Miss	Nikki	Loveday	Miss	Joanna	White

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: Plastanybwlch@compuserve.com.

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

4 April. Earthwatch Europe Lecture. Digging Deep Down under, Australian Conservation. Details from: Earthwatch Institute Europe, 57 Woodstock Road, Oxford OX2 6HJ. Email: info@earthwatch.org.uk

5-7 April. The Mammal Society's Annual Conference, University of Swansea. Details from: The Mammal Society, 15 Cloisters House, 8 Battersea Park Road, London SW8 4BG. Tel: 020 7498 4358, Fax: 020 7622 8722, Email: enquiries@mammal.org.uk

8 – 9 April. The Eighth Annual International Sustainable Development Research Conference. Details from Elaine White, Conference Coordinator, ERP Environment, PO Box 75 Shipley, West Yorkshire BD17 6EZ. Tel: 01274 530408. Website: www.erpenvironment.org. Email: Elaine@erpenv.demon.co.uk

11 April. Ecological Impact Analysis - IEEM Conference

Location: Birmingham Botanical Gardens Details and Booking s alable from IEEM Office.

15-17 April Conservation Pays? British Grassland Society/BES, University of Lancaster. Details from: BGS Office, No 1 Earley Gate, University of Reading, Reading RG6 6AT. Tel: 01189 318189, Fax: 01189 666941, Email: bgs@patrol.i-way.co.uk

17-19 April. BES Annual Symposium, 2002: Macroecology: Reconciling Divergent Perspectives on Large Scale Ecological Processes, University of Birmingham. Details from: BES Office or website: <http://www.demon.co.uk/bes>

18 April. Extra date. Great Crested Newts - Survey, handling, licenses and the law. IEEM Professional Development Programme: Details from IEEM Office

2 May. Extra date. Translocation of Great Crested Newts. IEEM Professional Development Programme: Details from IEEM Office

17 May. Note the date has changed. Using Bryophytes as habitat indicators. Orpington, Kent. IEEM Professional Development Programme: Details from IEEM Office

17 - 19 May. Bats and Bat Surveys: a three day foundation course for environmental professionals, Exmoor. Details from: The Bat Conservation Trust (BCT), 15, Cloisters House, 8 Battersea Park Road, London SW8 4BG. Tel: 020 7627 2629, Fax: 020 7627 2628, Email: gsargent@bats.org.uk

21 – 23 May. et2002. Climate Change – Our Business' Conference. NEC, Birmingham, Hall 7. Website: www.et-expo.co.uk

22 May. Integrated Coastal Zone Management (ICZM)

Location: South Devon IEEM Professional Development Programme: Details from IEEM Office.

23 May. Earthwatch Europe Lecture. From Curious Plants to Crocodiles, Conservation in Africa.

Details from: Earthwatch institute Europe, 57 Woodstock Road, Oxford OX2 6HJ. Email: info@earthwatch.org.uk

28 – 29 May. All Energy Opportunities Conference and Exhibition. An up-to-date market overview for Windy and wet renewables. Aberdeen Exhibition and Conference Center, Bridge of Don Aberdeen, AB23 8BL. Tel: 0122 4461345.

29 May. Restoration of Ancient Woodlands

Near Conwy, North Wales. IEEM Professional Development Programme: Details from IEEM Office.

15 June. Francis Rose and his contribution to British Botany: 80 Birthday Conference, Reardon-Smith lecture theatre, National Museum of Wales, Cardiff.

Details from: Dr Tim Rich, Department of Biodiversity and Systematic Biology, National Museum & Gallery, Cardiff CF10 3NP. Tel: 02920 573218, Fax: 02920 239829, Email: tim.rich@nmgw.ac.uk

9 – 11 July. Micro Science International Conference and Exhibition. Focusing on all the latest microscopy and imaging techniques. 37/38 St Clements, Oxford OX4 1AJ. Tel: 01865 248768. Email: info@rms.org.uk

5-8 September Butterfly Conservation's 4th International Symposium - Landscape and Lepidoptera Conservation, Lancaster University

Details from: Butterfly Conservation, Tel: 01929 400209, Fax: 0192940210 Email: info@butterfly-conservation.org

9 – 11 September. Working with Crayfish. Extra course due to large demand.

Malham Field Centre, North Yorkshire. IEEM Professional Development Programme: Details from IEEM Office

10-13 September. 11th IALE Conference. Avian Landscape Ecology: Pure and Applied Issues in the Large-Scale Ecology of Birds. University of East Anglia, Norwich, UK. Details from Dan Chamberlain, e-mail dan.chamberlain@bto.org or from the IALE web site: www.iale.org.uk/avian1.html

11 September. **British Ecological Society Annual Meeting.** Manchester Metropolitan University. Title TBA. The British Ecological Society, 26 Blades Court, Putney London, SW15 2NU. Tel: 02088719797. www.britishecologicalsociety.org or Email: general@ecology.demon.co.uk

11 September. British Ecological Society Annual Meeting. Manchester Metropolitan University. Title TBA. The British Ecological Society, 26 Blades Court, Putney London, SW15 2NU. Tel: 02088719797. www.britishecologicalsociety.org or Email: general@ecology.demon.co.uk

16 – 17 September. University of Lancaster. Modular short courses for professionals. Exploiting the leaf, Atmosphere interface. Website: www.Lancs.ac.uk/depts/ps or ring 01524 592784

16 – 17 September. University of Lancaster. Modular short courses for professionals. Exploiting the leaf, Atmosphere interface. Website: www.Lancs.ac.uk/depts/ps or ring 01524 592784

17 October. Earthwatch Europe Lecture. The Earthwatch Balloon Debate: Threatened Habitats. Details Earthwatch institute Europe, 57 Woodstock road, Oxford OX2 6HJ. Email: info@earthwatch.org.uk

17 October. **Earthwatch Europe Lecture. The Earthwatch Balloon Debate: Threatened Habitats.** Details Earthwatch institute Europe, 57 Woodstock road, Oxford OX2 6HJ. Email: info@earthwatch.org.uk

27 & 28 November. IEEM Annual Conference and AGM - Urban Ecology.

Location: Newcastle Area. Details and Booking Forms available later from the IEEM Office or IEEM website .