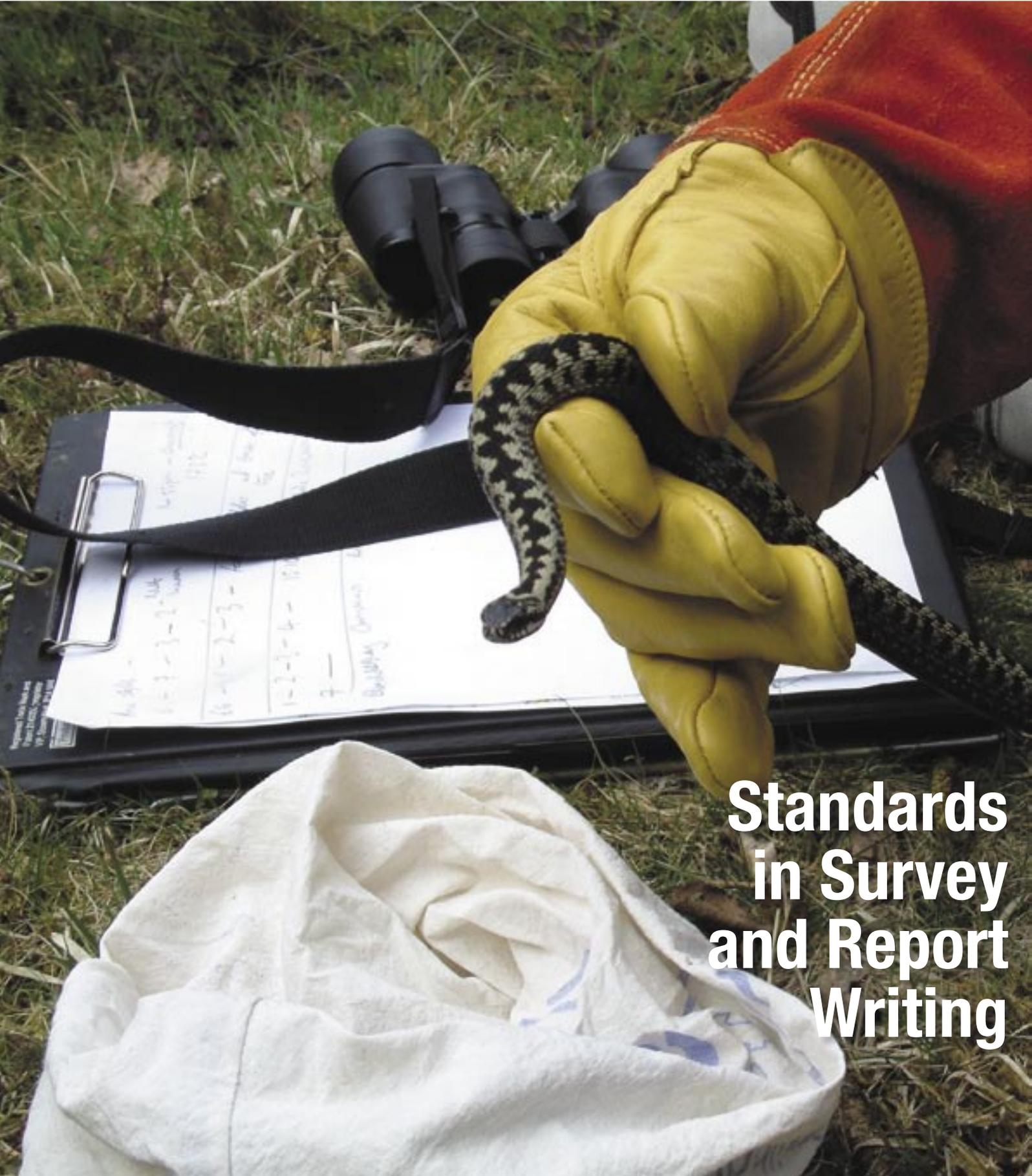




In Practice

Bulletin of the Institute of Ecology and Environmental Management



**Standards
in Survey
and Report
Writing**

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Editorial

Hello. My name is Stephanie, and I'm an ecologist. Sorry – just practising for tonight's meeting of Ecologists Anonymous. We meet regularly to discuss evolutionary stable strategies and plan how we will one day discover what drives cyclic population fluctuations in small rodents. How times change! When I first graduated it was perfectly acceptable (if a little unemployable) to be considered an ecologist. One wouldn't then, of course, accept the description of 'environmentalist' – the term had something of the campaign about it. Back in the early 1990s, an 'environmentalist' was more likely to be chained to a bulldozer than advising its driver on his environmental impacts.

Since the advent of SocEnv, however, and the rise of the Chartered Environmentalist, all that has changed. Environmentalism has been reclaimed as the professional designation of a wide range of practitioners. Conversely, the term ecologist has become diluted over the years. Anyone with an interest in a 'green' lifestyle seems to consider themselves an ecologist. You can buy an 'Eco-home', fuel it using 'Eco-tricity' and, should you wish, vote for David Cameron, the country's first eco-Tory. Now I'm as happy as the next man to go in for a little organic yoghurt-weaving, but surely there is some other name we can use for eco-sympathisers? Ecology, after all, is a venerable, and highly numerate, discipline of the natural sciences. It is incumbent upon us, as 'real' Ecologists, to define what that means through our professionalism.

The rapid growth of interest in the environment, driven by legislation and awareness in recent years has led to increasing demand for ecology professionals, particularly in consultancy. This demand seems even to have outstripped the rate of supply of higher education and the training facilities of the larger employers, leading to a generation of generalists. Obviously, none of us will ever be an expert in all aspects of ecology – the discipline is just too broad - and part of the appeal is to continue learning and improving our skills throughout our career.

My fear, though, is that if there is further rapid growth of the profession, particularly in consultancy, without a strong drive on professional standards, an ecologist will come to mean someone with a vaguely biological background, who has been shown how to shine a torch at a pond / look for holes in the ground / (substitute the field sign of your choice). But surely where we add value is in the understanding and interpretation of the underlying processes or as Douglas Adams would have put it – triangulating the vectors of inter-connectedness of all things?

The theme of this issue of In Practice - Standards in Survey and Report Writing – is therefore particularly pertinent. Through the rigour of our survey techniques and the transparency and user-friendliness of our reporting, the public will come to understand and value us as a profession, hopefully bringing closer the day when we may hold the designation Chartered Ecologist. We don't need to be reminded to wear our wellies, or to tie our pencil to our clipboard. We do need intelligent debate on the applicability and limitations of different survey techniques – at least when we're not busy cracking that vole cycle problem.

Stephanie Wray CEnv FIEEM
 Director, Cresswell Associates, part of the Hyder Consulting Group

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Cover image: Surveying for adders, the UK's only venomous snake, on Baddesley Common, Hampshire.

Photography: Jon Cranfield MIEEM

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

Rapid Dead Wood Habitat Assessment

David Hubble CEnv MIEEM* and David Hurst MIEEM**

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**Freelance ecological consultant

Introduction

Dead wood is well known as an important habitat for a diverse range of invertebrate species and as such is of great conservation value. Indeed, some 1,800 British species are known to be dependant on wood decay processes (Alexander 2002). A large proportion of these are local or rare, and many are in decline in Britain and further afield (Kirby 2001) with few sites showing continuity of large volumes of dead wood, especially given woodland management's tendency to 'tidy up' dead wood and 'unsound' trees (Fry and Lonsdale 1991). However, requests for dead wood survey work highlighted some key issues which have led to this habitat being surveyed relatively rarely. Equally, the amount and quality of dead wood required to support a diverse invertebrate fauna is widely and greatly underestimated.

From the outset, it became clear that there was no standard method for assessing dead wood habitat. To survey the invertebrate fauna directly is time-consuming and requires considerable specialist expertise, and is therefore prohibitively expensive. This approach is also limited to certain times of year and some methods undesirably destructive to the habitat itself. The forestry approach where fallen timber volume is calculated using line transects misses most dead wood types and is of limited practical value. Therefore, it was desirable to develop a method that was quick, cheap, inclusive of a wide range of dead wood types, usable by non-specialists and able to be undertaken at any time of year. Although no specialism is required, the method assumes reasonable observation skills and at least a basic level of woodland knowledge and experience. The output should be a description of the current status of dead wood in a survey area and management recommendations designed to maintain or improve this.

Key Parameters in Assessing Dead Wood Habitat

Firstly, diversity of dead wood types needs to be assessed as a wider range of sizes and forms increase the chances of a rich invertebrate fauna being supported (Kirby 2001). Secondly, the volume of dead wood needs to be determined. Rather than assuming that a few dead trees and pieces of fallen timber are sufficient, as much as possible is required, especially where there is a rich fauna with specialist species having little suitable timber at any given time (Fry and Lonsdale 1991). Thirdly, the continuity of dead wood habitat must be included as the dead wood fauna follows the decay succession and even brief periods of habitat shortage can lead to local extinctions of sensitive species. Continuity of habitat is therefore essential in both the long and short term (Fry and Lonsdale 1991) and as such, woodland structure may be used to guide future management (Kirby 1988). Thus the three key parameters used here in

assessing dead wood habitat are diversity, volume and continuity. Though inter-related, these are defined as follows:

- Diversity – the number of categories of dead wood present in a sample area.
- Volume – The amount of dead wood present across the categories comprising the diversity.
- Continuity – whether the diversity and volume of dead wood will be maintained given the range of tree species at different stages which are present, and whether this range of species is sufficient to support a diverse dead wood invertebrate fauna.

General Site Assessment

The survey area first needs to be divided into survey blocks. Try to use compartments if they exist and have been mapped, but if a block is too large, too complex or covers more than one woodland type, it should be subdivided until the block size is workable. If a block is subdivided, the boundary needs to be mapped using features which will remain identifiable in the long term so that follow-up work can be accurately undertaken. The key factor when determining block size is that the surveyor needs to be able to have a 'feel' for the whole block so as to assign meaningful scores (as detailed overleaf), and note-taking may aid this. A route through the block is then walked and mapped, noting and mapping key woodland features and using a zigzag route from which the whole block is visible. Binoculars are useful in ensuring coverage, especially of features high in the canopy. The surveyor should then walk back through the block to cement their 'feel' for it. Comments should also be made regarding the effects of prior or proposed woodland management and external factors such as visitors and unmanaged grazing.

Assessment of Dead Wood Diversity

As it is known that dead wood occurs in a range of forms and that a wide range should be retained for conservation purposes, the 16 types described by Kirby (2001) were taken as the starting point in developing this methodology. For each block, the presence or absence of each of the following type of dead wood is noted;



Hollow section of trunk.
Photo: David Hurst



Dead wood showing insect holes.
Photo: David Hurst

1. sun-baked wood. Binoculars may be useful for this. The surveyor should look for greying or hardening, although this may be difficult in wet conditions;
2. fungus-infected bark;
3. fine branches and twigs (on the ground, below 5 cm diameter as set by Kirby *et al.* 1998);
4. bracket fungi;
5. birds' nest holes. Binoculars may be useful for this. The surveyor should look for widening, smoothing or reshaping of holes;
6. stumps;
7. hollow trees (can be whole trunks or single branches);
8. burnt wood;
9. large fallen timber (above 5 cm diameter);
10. dead outer branches (still attached to the tree);
11. rot-holes;
12. standing dead trunks;
13. roots showing signs of decay;
14. well-rotted timber;
15. wet fallen wood (if in long-term water features, not temporary puddles); and
16. rotten heartwood.

The diversity score is the number of categories present with a score of 0 - 8 indicating a 'poor' dead wood diversity, 9 - 11 'medium' and 12 - 16 'good'.

Assessment of Dead Wood Volume

For each dead wood type present, assign a frequency using an AFOR scale where A = Abundant, F = Frequent, O = Occasional and R = Rare. This is simply a modified DAFOR (Dominant, Abundant, Frequent, Occasional, or Rare) scale and the concept of dominance is not considered relevant here. This scale is used as it is widely familiar and easy to visualise. Then, numerical scores are assigned to each category where A = 4, F = 3, O = 2 and R = 1. These are added to give the volume score for the block where 0 - 19 indicates a 'poor' dead wood volume, 20 - 25 'medium' and 26 or more 'good'. The 'medium' grade is covered by a fairly narrow band of all possible scores because very high and very low scores are unlikely. In practice, most blocks have a volume between about 10 and 35.

To reduce the effect of block size which would otherwise lead to larger areas inherently scoring more highly for volume, note that scores are by *density* of occurrence rather than absolute number. Therefore the surveyor must estimate the volume of each category *given the size* of block.

The scoring system for volume is weighted in favour of smaller, rarer dead wood habitat types (as a single rot-hole and a single fallen trunk would both score 1 despite their difference in actual volume). This is taken into account by the greater scarcity and conservation value of rarer dead wood types which contribute to the overall habitat quality of a block, and the greater likelihood that smaller features will be missed however much care is taken. Also, note that the AFOR scale varies by category as some dead wood types are inherently rarer than others. For example, it only requires a few nest holes for them to be deemed 'frequent', whereas fine twigs in their thousands may equally be 'frequent'.

Assessment of Dead Wood Continuity

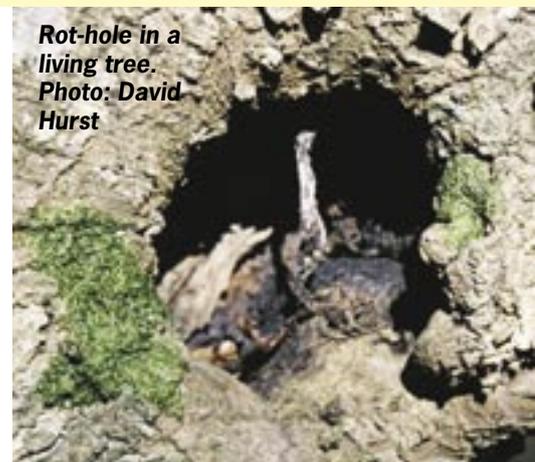
Continuity considers how well the key tree species in a block are represented by all stages from seedling and regeneration to veteran, overmature and dead. This is described in terms of possible management for dead wood habitat. Continuity categories are assigned as follows:

- Poor - Few species and/or major gaps in the range of stages (especially if planted and even-aged). This means the dead wood habitat present will only last in the short term without beginning to degrade and much management work is needed to redress this.
- Medium - Most key species show most stages and will last into the medium term, though there may still be a fair amount of management work required to extend the dead wood resource into the long term.
- Good - All key species have most stages. Gaps are therefore easy to fill and the dead wood habitat will last long term.

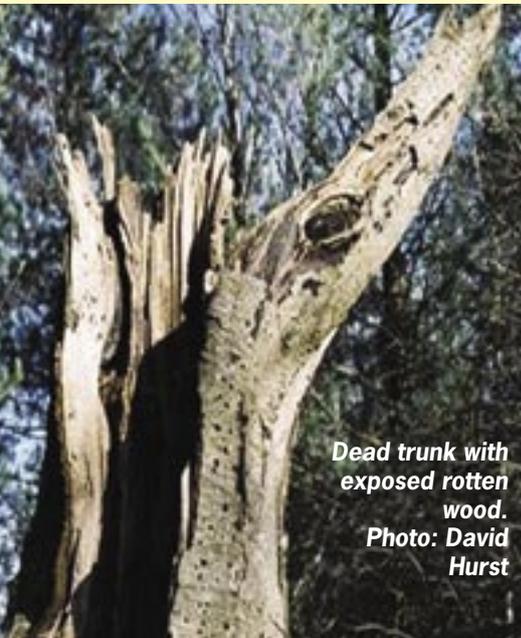
Woodland Management

It is beyond the scope of this article to cover management for dead wood in detail, but some points help to put the methodology into context. Firstly, native deciduous trees support the richest dead wood invertebrate faunas, especially if large, long-lived and slowly decaying, such as oak (Kirby 2001). Management should promote a range of tree species, particularly those which have been present on site for many years, with locally indigenous tree species being a priority (Fry and Lonsdale 1991). Associated species should also be considered e.g. open-structured flowers such as umbellifers and hawthorn are important food sources for the adults of insects with dead wood larvae and should therefore be encouraged in locations such as rides. Management for dead wood should be undertaken alongside, not instead of, management for other aspects of woodland conservation. Although some management such as coppicing may reduce the diversity and volume of dead wood habitat in the short term, it may improve continuity and benefit dead wood faunas in woodlands where coppicing was traditionally undertaken (Kirby 2001). Many other actions are straightforward such as avoidance of unnecessary tidying, leaving high stumps, and retention of ancient tree features. The key broad aims of management, in order of priority, are as follows:

1. ensure that dead wood 'hotspots' do not deteriorate, increase their ecological value where possible, and integrate their management into that for the site as a whole.
2. link these hotspots as far as possible;
3. increase the diversity, volume and continuity of dead wood habitat across the remainder of the site, aiming to match that in any hotspots present. Ensure that improving one dead wood type does not cause a deterioration in another, and that improvements in dead wood do not damage other habitat types or conservation aims.



Rot-hole in a living tree.
Photo: David Hurst



Dead trunk with exposed rotten wood.
Photo: David Hurst

Sites Used for Field Testing

Three contrasting woodland sites were chosen for field testing this assessment methodology. They were chosen as they covered a range of levels of quality of dead wood habitat and a variety of known management approaches:

1. Chantry Wood

Recorded from 1486, a 60.8 hectare woodland on the

edge of Guildford, Surrey comprising both conifers and broad-leaves. During World War II, much of the wood was clear-felled, then planted with conifers in the 1950s and 60s although some areas of coppice-with-standards and native woodland remain. Recent selective thinning has increased light penetration in conifer stands, increased the volume of dead and dying timber, and encouraged natural regeneration of native broad-leaves.

2. Curbridge

A 5.6 hectare strip of ancient woodland alongside tidal stretches of the Rivers Cur and Hamble, Hampshire. Some of the site has been coppiced and some areas planted with larch which have since been felled at an overmature stage. The woodland also includes wet flushes and old boundary and other internal banks.

3. New Forest (Millyford Bridge, Highland Water and Knightwood Oak)

These three areas in Hampshire are typical of many wooded sections of the New Forest with a relatively large number of large trees. An area measurement was not available and the surveyed sections are continuous with unsurveyed woodlands. There is grazing pressure on the understorey even in the fenced areas as deer have been seen. The areas surveyed do not have a history of forestry planting or coppicing and only broad-leaved sections were covered. Apart from grazing by wild animals and New Forest ponies, woodland management in these areas is largely non-intervention and they are reputed to be of high conservation value for dead wood invertebrates.

Evaluation of Assessment Methodology

This methodology takes a rapid and practical approach which provides a snapshot of the current dead wood status of a site. This is detailed enough to use in:

- identification of problems with dead wood habitat and determination of management prescriptions required to overcome them;
- identification of features or areas showing high dead wood habitat quality and determination of management to maintain or enhance these 'hotspots';
- prioritising and integrating dead wood habitat into overall site management and management plans; and
- provision of baseline data for ongoing monitoring.

Overall, it is intended that this methodology will help to redress

the lack of dead wood surveys undertaken and challenge the view that dead wood surveys are an expensive luxury. This has the potential to provide information which improves dead wood habitat management, and ultimately increases the quantity and quality of the habitat itself.

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Bracket fungi on a standing tree.
Photo: David Hurst

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Large-Scale NVC Mapping in Complex Vegetation

Richard Carter CEnv MIEEM
Director, Carter Ecological

Introduction

National Vegetation Classification (NVC) mapping may be a key output of NVC surveys for purposes ranging from baseline description to vegetation monitoring. Mapping is easy if boundaries between vegetation types correspond to base-mapping features, e.g. fences. If they do not then accurate and detailed mapping at NVC sub-community level can be difficult even in small sites, and over large areas the difficulties may be intractable. How difficult it all becomes depends first on the complexity of the vegetation, and second on the character of the terrain in so far as it determines the adequacy of available base-mapping relative to that complexity – even 1:500 mapping of something like a salt-marsh or a dune-system may be devoid of fixed reference points in places where a dozen NVC communities need to be mapped.

At very large scales, vegetation mapping commonly derives from interpretation of satellite imagery in conjunction with air-photography and ground-truthing by sparse vegetation sampling. At this scale vegetation boundaries are likely to be statistically interpolated from point-location data, especially in featureless terrain such as Sahelian rangelands or UK moorlands. At the other extreme, NVC mapping at small scales commonly derives subjectively from sketch-mapping, because the cost of formally surveying-in vegetation boundaries is seldom supportable. It therefore remains a problem to locate vegetation boundaries on base maps with any confidence.

In this article we address some of these issues by reference

to the case-study of a detailed NVC survey carried out over a relatively large area, i.e. the 400 ha Malvern Hills SSSI in the west of England (Worcestershire and adjoining counties). The survey was commissioned by the Malvern Hills Conservators in support of a five year management plan for the hills.

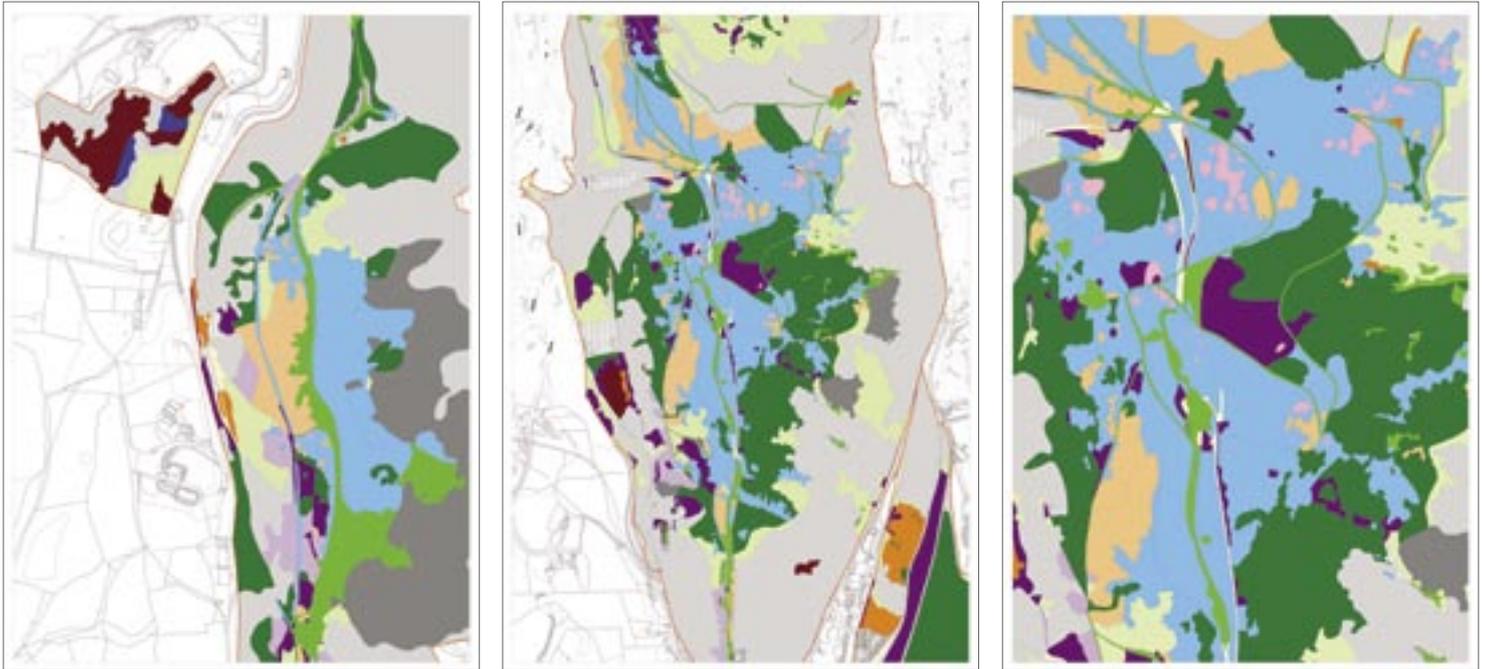
NVC Mapping Issues in the Malvern Hills

The Malvern Hills SSSI exemplifies many commonly encountered problems in NVC mapping. First, diverse topography combines with variation in land management to produce mosaics of vegetation types that are far more complex than the features on base maps. Second, the vegetation types are of kinds that grade into one another, so that mosaics of NVC types are further complicated by transitions between NVC types. Third, much of the vegetation cannot readily be assigned to standard NVC types because the survey area is located where lowland NVC types grade into upland types, so that vegetation types fall between NVC types even before within-site transitions are taken into account (or they may not have been described at all). And fourth, tangled vegetation on steep slopes precludes easy access over large areas.

The Vegetation

In any NVC survey decisions have to be made about phytosociological resolution – whether to map just NVC communities or whether to map sub-communities and variants, and whether to map variation not compassed within the NVC, such as non-NVC communities or local variants of standard NVC communities. This presupposes a more than usually adequate understanding of the vegetation. It is all too easy to suppose that the vegetation in a survey area can easily be pigeonholed





Example maps for the Malvern Hills.

into standard NVC types when it cannot, and therefore to discover too late during the progress of fieldwork that there is a requirement to map initially unrecognized vegetation types.

In the Malvern Hills, the lower slopes are predominantly secondary woodland, while the upper slopes are largely clothed with bracken or rose-bay willowherb with brambles throughout. Of greater conservation importance are the calcifugous grasslands of the ridge. These mostly belong either to the lowland NVC type U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland or to U2 *Deschampsia flexuosa* grassland or to transitions between these types, but owing to additional affinities with the upland type U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland they are hard to pigeonhole using standard NVC types. We therefore described and mapped no fewer than four non-standard variants of U1 including a lichen and spring-ephemeral variant distinct from similar East Anglian sub-communities described in *British Plant Communities*, and several types perhaps transitional to various U2 or U4 sub-communities, and even to CG10a *Festuca ovina-Agrostis capillaris-Thymus praecox* grassland, *Trifolium repens-Luzula campestris* sub-community (itself tentatively identified in a few places). Had we not achieved this level of understanding, then matters would have been clouded by uncertainty about what to map as U1 and U2 and whether to map U4, and it would be hard to exaggerate the subjectivity of the mapping that would have resulted (and therefore the lack of repeatability). In short we would have been unsure of what to map had we not first probed the limits of the standard NVC types by sampling and analysis. And we do not for one moment believe that this was an unusual feature of this project only!

Again, in this case mapping of transitions between NVC types was required for conservation management objectives underlying the survey request. It was therefore critical to identify core vegetation types – whether standard NVC types or *ad hoc* variants – so that transitions could be identified unambiguously. In similar surveys it may well be a practical test of adequate understanding of the vegetation that it can all be readily assigned either to an NVC type or a transition.

Field Survey Methods

The selection of field survey methods pivoted on a requirement to produce data suitable for handling in the MapInfo

GIS package. As in any survey, they also turned around considerations of cost-effectiveness.

The choice of base-mapping for mark-up in the field is a key decision. At this scale of survey, air-photography provides more detail than any cartographical form of mapping, and A3 size copies of air-photographs were therefore used for marking-up survey information in the field. The advantages of this were enhanced by incorporation of air-photography into the GIS package. Ortho-rectification altered the air-photography to sit precisely over a cartographical GIS map base; and printing at 1:1000 (so that 1 cm represented 10 m) allowed ample space for legible sketching and annotation under difficult field conditions, and also allowed paced-out distances, e.g. vegetation patch-sizes, to be marked with ease in the field. White-ink pens were essential for marking information onto the predominantly dark green air-photographs. A disadvantage of 1:1000 air-photography that might be critical in featureless terrain is the difficulty of orientating on the numerous sheets (only 400 m to a sheet).

Coarse vegetation boundaries, e.g. boundaries between grassland and bracken, can of course be seen on air photographs, though differences between structurally similar NVC types (e.g. U1 and U2, or bracken and willowherb) are not usually discernible. Still, this obviously assists field mapping, but unless the air-photography is up-to-date – in this case it ranged from seven to 16 years old - there is always the possibility that vegetation has changed and vegetation boundaries have moved. Where detail on the air-photographs looked correct in the field it was therefore nonetheless important to check the position of vegetation boundaries by reference to more-or-less unchangeable features including roads, car parks, paths (except for desire-lines on open hillsides), buildings, countryside furniture, garden fences, power lines, the larger trees, quarries and rock outcrops. Where such features were lacking, vegetation boundaries were sketched onto the air-photography to the best ability of the surveyor, and checked using a hand-held GPS device giving a ten-figure National Grid reference (*i.e.* a reading to the nearest metre) with a stated error of about 6 m where satellite reception was good (hand-held GPS devices accurate to a metre can nowadays be obtained for a price). But time did not allow for large numbers of GPS points along uncertain vegetation boundaries, and small numbers were therefore recorded where boundaries crossed linear features (mostly paths), at inflection points on curved boundaries, and at

occasional reference points on long straight boundaries.

These techniques allowed traditional sketch-mapping of NVC types to be carried out reliably and cost-effectively for relatively complex vegetation in difficult terrain. On the steep slopes of the Malvern Hills it is hard to judge distances to vegetation boundaries above or below, and GPS was especially useful for mapping grass-bracken boundaries in the relatively few places where grassland extends down-slope.

The ridge of the Malvern Hills is easily walked, but to traverse the steep, bracken and bramble-covered slopes in any systematic way would be prohibitively slow and slightly hazardous (many paths cross the slopes but still leave large areas inaccessible). This placed beyond consideration several field-sampling techniques that are widely used for vegetation mapping, especially the many that involve recording along transects, or the rapid sampling of grids. In particular it precluded the collection of point-data that might be used for the statistical interpolation of vegetation patterns – an increasingly promising approach in more easily traversable vegetation. Such techniques might well be used for the monitoring of some grassland areas within the Malvern Hills SSSI, but not at the scale of the SSSI as a whole.

Digitising Field Data

NVC compartments were entered into MapInfo by scanning air-photographs that had been marked-up in the field, referencing the scanned images to the GIS map-base, and digitising over the white-pen field annotations. The MapInfo 'check regions' option was used to identify any errors in digitising, e.g. gaps

(incomplete GIS polygons), self insertions and overlaps. This made sure that the data was 'clean' and met the requirements of the English Nature GIS standards for Phase II Habitat Surveys, and more generally for the provision of a searchable GIS database. GPS readings were treated as GIS 'point objects' and sketch-mapped vegetation boundaries that failed to coincide with the GPS points were adjusted by the GIS technician.

Outputs

The principal output was a fully searchable GIS database containing the entirety of the qualitative and spatial vegetation data. Over 2,100 GIS polygons from 5 m across upwards were assigned to 27 vegetation categories comprising 20 standard NVC sub-communities and six *ad hoc* variants in three standard NVC communities and one *ad hoc* non-NVC vegetation types, or else to transitions between these types. In addition, many compartments were identified as containing irresolvable mosaics of these vegetation types in defined proportions, e.g. U1b (60%) + U2a (40%). The GIS database can be searched for specific vegetation types, and their location can be displayed on screen, with access to the full NVC data behind each polygon.

It was not possible to represent all of these vegetation categories by colour coding in hard-copy maps, and for this purpose similar vegetation types were grouped into 18 categories to which colour codes could be assigned. Thus a colour-block having compartment boundaries within it represents the situation where similar but different vegetation types occur side by side.

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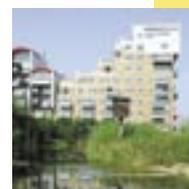
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Local Wildlife Sites in West Lancashire - Promoting Best Practice



Figure 1 - View from Gorse Hill LNCS showing a typical view of the West Lancashire Landscape.

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Introduction

West Lancashire District Council commissioned a project to prepare Local Nature Conservation Site (LNCS) selection guidelines and to review existing and candidate LNCSs. Background research for the LNCS work, combined with past experience has led the authors to form the opinion that local site selection guidelines - where they exist at all - are variable in coverage/scope and rather inconsistently based.

This article reviews the background to local site selection, includes a summary of the West Lancashire Project and makes suggestions to promote best practice in order to reduce inconsistency in the development of local site selection guidelines.

The Background

'Trying to describe local nature conservation site systems is rather like cataloging migrant birds – just when you think you have covered every possible eventuality, another one crops up' (Thomas 2001).

The Wildlife Trusts published a view of Local Site selection as *Gaining Ground* (Everitt et al. 2002). The Wildlife Trusts' view of selection criteria was that they should:

- prescribe who should be involved in assessing sites, the need for adequate data and the importance of recording the assessment procedure; and
- be closely linked to national and local Biodiversity Action Plan

(BAP) priorities to contribute to sustainability in the local area, by:

- identifying national priority species and habitats (listed in the EU Habitats Directive or UK BAP) that occur in the local area;
- identifying other locally important species and habitats based on local rarity, local decline rate, their position in a geographical range or local distinctiveness; and
- evaluating and agreeing the proportion of these identified species and habitats that need protecting within the local area.

Natural England's Position Statement (English Nature 2002) on Local Sites stated that:

'Local Site systems should include sites of either biological or earth science interest. The selection process for sites must adhere to a national framework, but be sensitive to local circumstances. The Nature Conservation Review (NCR) and Geological Conservation Review (GCR) criteria should be used as the basis for site evaluation and subsequent selection of biological, geological and geomorphological sites.'

*'For a Local Site system to be effective it needs to have the support and endorsement of a wide range of organisations and individuals. All Local Site systems should be fair, open, transparent and work to **common principles**, and should follow standard guidelines both in terms of site selection and administering the system.'*

Since commencement of the project in West Lancashire, new legislation

and government guidance has been published. The project evolved in the light of these key legislative and planning drivers:

- Section 40 of the Natural Environment and Rural Communities Act 2006 which states that 'every public authority must, when exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'.
- Planning Policy Statement 9: Biodiversity and Geological Conservation says that 'sites of regional and local biodiversity interest, which include... Local Sites, have a fundamental role to play in meeting overall national biodiversity targets; contributing to the quality of life and the well-being of the community; and in supporting research and education. Criteria based policies should be established in local development documents against which proposals for any development on, or affecting, such sites will be judged'.
- DEFRA published *Local Sites, Guidance on their Identification, Selection and Management* in 2006. DEFRA's guidance aims to promote 'more transparent and consistent approaches in the operation of Local Sites systems across the country, embracing regional and **local diversity** and variation within the natural environment'.

West Lancashire – Landscape Context

West Lancashire district is a predominantly flat or gently undulating coastal plain arising on soft glacial

| FEATURE | PRIMARY GUIDELINES | SECONDARY GUIDELINES |
|--------------------|---|---|
| Woodland and scrub | All ancient woodlands over 0.5ha. Other semi-natural (or re-planted with native broad-leaved species) woodlands >1.0ha where field evidence indicates they are ancient in origin. Other larger woodlands (> 1ha) which add to the biodiversity of the Landscape Zone, or are regionally typical (i.e. caer woodland). Any woodland that contains colonies of native bluebells extending over 500m ² . | The site contains blocks of semi-natural oak, birch or ash woodland totaling more than 1ha, or woodland forms part of a larger habitat mosaic. The site contains woodland and is significant in the district due to a lack of woodland cover. Native plantation (>100 years old) which contribute significantly to local landscape and wildlife value (e.g. Scots Pine shelter belts). Woodland supporting colonies of native bluebells over 100m ² and less than 500m ² . |
| | Broad-leaved woodlands over 1ha which have >3 'old' trees with four features from Table 1. Wet willow, birch or alder dominated woodlands >0.25ha with the water table seasonally near or above the surface. Oak/birch woodland on rocky slopes of any size, with or without a bryophyte carpet. Native scrub >0.5 ha. | N/A. Fringes of wet woodland >0.25ha associated with other wetland habitats - open water, reed bed, marshy grassland, fen or bog. Stands of native scrub where they form part of a larger habitat mosaic. |

Box 1 An extract from the habitat selection guidelines.

and post glacial deposits of clays, sands and marine alluvium (Figure 1). This is intensively farmed with large arable fields and some small deciduous woodlands and shelter belts. Relict peat mosslands are reclaimed through drainage and are intensively managed for crops. The flat mosslands are typically broken up by pine shelterbelts. The east of the district features wooded gritstone ridges which support a land use of mixed farming and some forestry. Enclosed coastal marsh has also been reclaimed through drainage and consists of improved pastures criss-crossed with drainage ditches. This enclosed coastal marsh and the adjoining open coastal marsh support much of the wildlife interest in the district. Many of the statutory wildlife designations are concerned with wading and migratory birds - the Ribble Estuary and fields around Martin Mere, Halsall, Downholland and Altcar support up to 20% of the world population of pink-footed geese through the winter. West Lancashire is also of international importance for wintering duck and waders, and nationally important for wintering Bewick's and whooper swans.

Semi-natural habitat is rare in West Lancashire – it contributes only 8% of land cover, and nearly 40% of this is saltmarsh. Only 4.8% of the District is non-coastal semi-natural habitat and most of this is woodland, confined to old quarry sites, steep stream sides (clough woodland), plantation and shooting coverts.

Aside from the sites of international and national importance, the district also supports sites of local importance for nature conservation which are of two types; Biological Heritage Sites (BHS) and Local Nature Conservation Sites (LNCSs). These are both non-statutory designations and are adopted principally for land use planning purposes. BHS which are of county or regional significance are identified by the BHS sites review panel which comprises professional ecologists from Lancashire County Council, Natural England and the Wildlife Trust for Lancashire. LNCSs are designated by West Lancashire District Council. There are currently 85 BHSs in West Lancashire and 29 existing and proposed LNCSs. Most of the LNCSs were designated following field survey in the summer of 1994 (Jerram 1994).

The Development of the Guidelines – What They Do and Don't Address

A key reference point for the development of the West Lancashire LNCS guidelines was the Lancashire County *Biological Heritage Site Selection Guidelines* (Lancashire County Council *et al.* 1998). The BHS guidelines are in general based upon those used by Natural England (Nature Conservancy Council 1989) for the selection of Sites of Special Scientific Interest (SSSIs). The BHS guidelines also make reference to the criteria set out in *A Nature Conservation Review*

(Ratcliffe 1977) which take account of: size, diversity, rarity, naturalness, fragility and typicalness.

Given the nature of the landscape in West Lancashire, guidelines from similar low lying and intensively managed regions were also reviewed. Of particular interest were guidelines from Cambridgeshire (The Wildlife Trust for Bedfordshire *et al.* 2005), Leicestershire and Rutland (English Nature *et al.* 2001), and Cheshire (Cheshire County Council 2000). Following review of these documents, guidelines for flowing and standing water, 'old' trees and the social aspects of sites from Leicestershire and Rutland were adapted and used within the West Lancashire guidelines.

The development of the guidelines for West Lancashire was undertaken with the assistance and scrutiny of a number of local experts and naturalists. Many of the guidelines were a collaborative effort, arrived at through discussion and finally testing in the field. Initially, the BHS guidelines were simply 'downgraded' by a third, i.e. made less stringent, and habitats and species in the guidelines that were not relevant to West Lancashire were removed. Other details not relevant to the District, for example details about particular local hedge types, were also adjusted or removed where appropriate.

The West Lancashire LNCS guidelines are in two tiers - primary and secondary guidelines. This approach recognises that whilst the primary interest of a site is based upon substantive nature conservation value (see Box 1 for an example) appropriate consideration is given to social interest. Sites that do not meet the primary guidelines for nature conservation value may meet secondary guidelines which are less stringent. To qualify as an LNCS, a site meeting secondary nature conservation guidelines would also have to meet a social value guideline.

The social use of a site, or a site's value (perception) to the local community is notoriously difficult to measure. Heliwell (1983) includes a quote (Hope 1971) from work studying the reactions of various groups of people to different environments:

'It is of particular interest that every one of the 24 photographs was selected at least once as 'the Most Preferred Place', even the outskirts of Wigan on a wet day.'

Whilst this might appear harsh to Wigannians, the quote illustrates the subjectivity of assessing social value. To reduce subjectivity, we used rather pragmatic and measurable guidelines produced by Leicestershire and Rutland. The LNCS social guidelines include features such as: how many access points a site has, the degree of use by walkers or any evidence of children making dens or dams (see Box 2 for an example).

The guidelines do not assess sites for their function as ecological corridors or networks. These are landscape aspects which are outside the scope of local site selection and may be

| FEATURE | SECONDARY GUIDELINES |
|---------------|---|
| Accessibility | The site meets the secondary Guidelines for habitats and is accessible and widely used by the local community, scoring one high or two moderate indicators. |

An Indicator of Accessibility

| Indicator | Level of Use |
|---|--|
| Proportion of site covered by paths and their level of use. | Moderate: Paths, either informal desire lines or hard core surfaces, indicating moderate coverage of the site (>1/2) and not just shortcuts between built up areas. No or little vegetation encroachment over paths. There may be smaller un surfaced paths leading from them. High: Paths, either informal (desire lines or hard core surfaces), indicating good coverage of the site (>1/2 - all) and not just shortcuts between built up areas. No vegetation encroachment over paths. There may be smaller un surfaced paths leading from them. Site contains paths that lead to features of interest or places of sit, drink and take in the view. |

Box 2 An extract from the social guideline for accessibility

dealt with in the future by a strategic 'Eco Network' approach.

Development of the LNCS guidelines was an iterative process once the first draft had been written. This required field testing and revision of guidelines throughout the contract period.

There is a clear habitat basis for the LNCS guidelines. The inclusion of social guidelines to support the selection of sites with wildlife interest but not meeting a primary guideline recognises the value of wildlife sites for people.

Consideration was given to species interests and this was dealt with by inclusion of a separate guideline referring to assemblages of Species of Conservation Importance in West Lancashire. The species guideline is supported by a supplementary table with the current list of Species of Conservation Importance in West Lancashire. Consideration was given to the inclusion of a guideline for artificial structures which might be used as roosts by bats. These are not included in the BHS guidelines. However, we are aware of statutory wildlife sites in such situations. The consensus of opinion was that existing legislative measures would be adequate to take account of these situations.

The LNCS guidelines are complete and comprehensive in terms of the current understanding of the value of wildlife interests in West Lancashire. We reviewed other local site guidelines which referred to 'insufficient information at present to develop a detailed guideline' or 'this guideline is likely to be subject to revision'. We deliberately avoided including such ambiguity as we felt this was not helpful to the conservation of local sites which might be tested rigorously through planning and was in our opinion not in line with the good practice promoted by Tyldesley (1999). These ambiguities all related to species or species groups which may never be resolved. The difficulties of evaluating local sites according to species interests lends support to adopting a primarily habitat based approach for local wildlife site selection guidelines.

The guidelines have been developed with the aim that an 'average' site could be assessed (and monitored) by a rapid

walkover survey (1-2 hrs) which would be adequate to assess the distribution of habitats and indicator species at a site. Clearly large sites will take longer and borderline qualifying sites might require more intensive surveys.

Candidate sites are then assessed by the selection panel before being surveyed further. A large scale map (see Figure 2) is also produced for each site showing broad habitat types (Nature Conservancy Council 1990) with a written description of each vegetation polygon and other features of interest.

Review of Sites

The majority of existing and candidate sites assessed within this study, 31 out of 37, met primary guidelines and were recommended as LNCSs. Four sites failed; of these three were very small and did not support semi-natural habitat that met any primary guideline, while one site was larger but supported habitat that was very species poor. Many sites qualified due to their extent of woodland.

Two sites were selected because they meet secondary nature conservation guidelines and are sufficiently used by local people to meet social guidelines (Figure 3).

It is notable that many of the LNCSs are dominated by or support woodland (22 out of 37 sites, see Figure 4), reflecting the land use of the district. Many of the woodlands occur on disused quarry sites where there is little disturbance and no management, or originated as game coverts within predominantly arable areas. Others are linear woodlands on steep cloughs alongside small watercourses unsuitable for agricultural use but with some recent use as shooting coverts.

Other habitats are less well represented. Only one site passed due to the extent and diversity of species rich grassland, a scarce and valuable habitat in West Lancashire represented in this case by a small strip between a railway and a canal. Two sites qualify due to the extent or rarity of the grassland type (acid grassland). Only four sites qualify

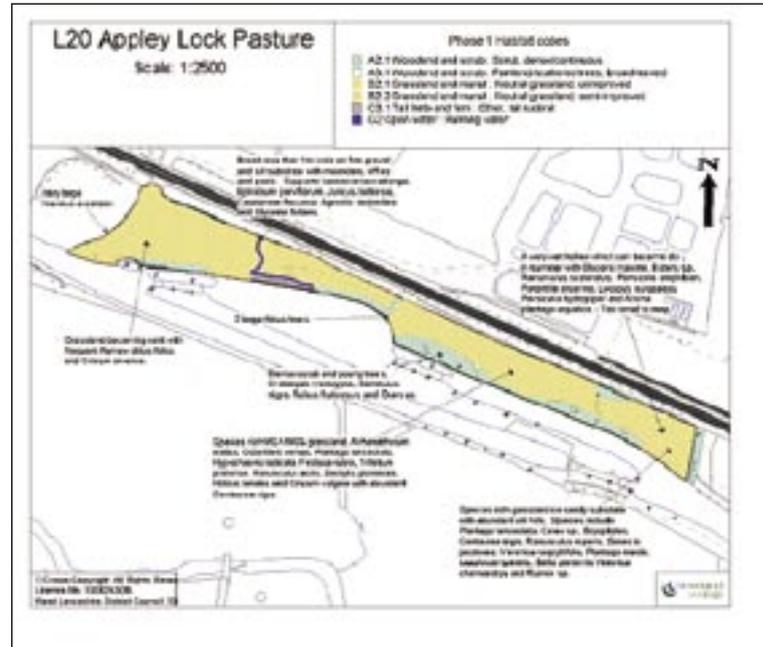


Figure 2 - GIS Phase 1 plan of an LNCS.

under scrub guidelines, six under rivers and streams and five under ponds (two of these due to the presence of great crested newts, see Figure 5). Most sites qualify under more than one guideline.

It is extremely likely that the current site system is incomplete. Some habitats are probably under represented in the district or may have been omitted (e.g. grassland) by previous surveys for some reason (e.g. access problems).

Concluding Remarks

Whilst writing this article the authors have been able to draw on their various experiences (including background research for the West Lancashire LNCS study) and have taken time to review some of the literature on the subject.

Whilst approaches to wildlife site selection have been available and accepted for many years there still appears to be a great deal of inconsistency across the country.

The West Lancashire Guidelines are unashamedly habitat based in the main, with simple species guidelines (referring to assemblages of species of known conservation value in the district) and social guidelines in recognition of the vital role that certain sites play in connecting of people and nature.

The recently published IEEM guidelines (IEEM 2006) 'therefore propose an approach to valuing features that involves **professional judgement** based on **available guidance** and information, together with **advice from experts who know the locality** of the project and/or the distribution and status of the species or features that are being considered.'



Figure 3 - Simonswood LNCS: a site meeting secondary habitat guidelines and social guidelines.

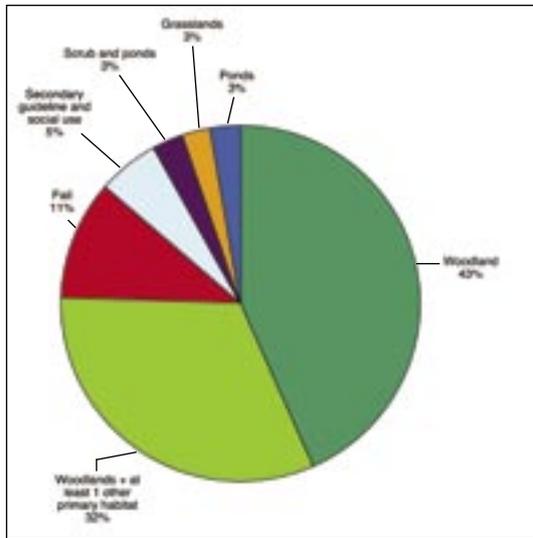


Figure 4 - Chart showing proportion of LNCs in relation to selection guidelines.

recent guidance and Natural England (as English Nature) have set out their 'position', there is a lack of a common approach or method. Possibly the idea is to devolve this to the various local authorities to make up their own minds! Hence... encouraging inconsistency. The aim of this article is to promote the approach adopted in West Lancashire with the intention of providing some assistance to other local areas going through this process and hopefully conform to the principle set out by Tyldesley (1999) that:

*'Locally designated sites of importance for nature conservation should be valued as the most important resource for biodiversity outside the statutorily designated sites. However, they [selection criteria] should be soundly based on best practice, publicly available, comprehensive, **consistent**, up to date, rigorously tested against specified criteria, included in local plans and relate only to sites with **substantive nature conservation value.**'*

Maybe the Association of Local Government Ecologists (ALGE) could provide a template for best practice or at least an efficient process for exchanging experience and knowledge in this area.

One final thought! The production of guidelines and selection of sites in this study has taken less than 12 months and has been, we feel, an efficient and effective process. Whilst partnership and consultation are essential, we would contend that to be able to undertake such an efficient study one should try to avoid 'design by committee'... but, as two of the authors are consultants we would always advocate this approach, wouldn't we!

A copy of the guidelines can be obtained from the Planning and Development Services Division of West Lancashire District Council.

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Whilst the IEEM guidelines refer to Ecological Impact Assessment the same thinking can be applied to selecting local wildlife sites.

As ecologists, we strive to avoid subjectivity, but by being so inconsistent in our approach to the conservation of non-statutory wildlife interests, we continually add subjectivity. Whilst DEFRA has issued

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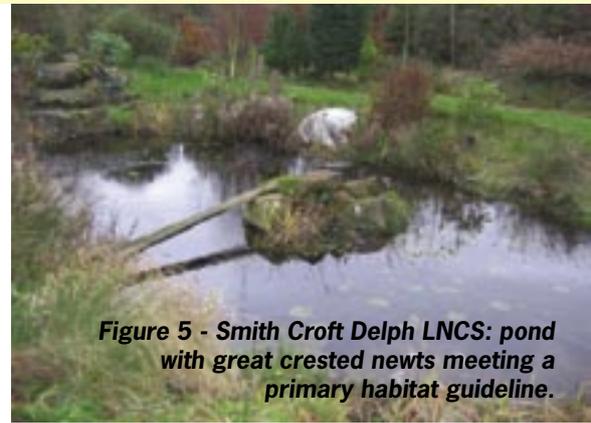


Figure 5 - Smith Croft Delph LNCs: pond with great crested newts meeting a primary habitat guideline.

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The authors wish to thank the following people who have contributed to the development of these guidelines:

Michael Wilcox for undertaking much of the field work. Dr Phil Smith for local expertise. Peter Jepson (Lancashire County Council), Dave Dunlop and Tim Mitcham (Lancashire Wildlife Trust) and Jon Hickling (Natural England) all members of the BHS partnership. Mrs Anona Finch (Secretary for the Leicestershire and Rutland Local Sites Review Panel).

Mapping Plant Distribution for Conservation Monitoring

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Summary

Mapping of vegetation is a core component of most ecological survey, whether for EclIA, remediation or conservation management planning. It is such a commonplace activity it would be easy to believe the methods we use were tried and, above all, tested as suitable. Yet sadly in many cases this is not the case. It can be argued that the two most common methods deployed, Phase 1 Habitat Survey and National Vegetation Classification (NVC), are simply not fit for the purposes for which they are frequently deployed. If we are to progress conservation as an evidence-based 'science' we need tools that can provide objective data and not subjective opinion.

Ecology is a beautiful and fascinating subject, which is probably why we were all drawn to it in the first place. Perhaps unique amongst the sciences, however, it exhibits a paucity of objective metrics, *i.e.* repeatable units of measurement. Rather it has come to rely on subjective 'impression'. We could speculate that chemistry would have been unlikely to have progressed from alchemy if the units of temperature were 'coolish', 'warm', 'hot', 'quite hot', 'oh! really rather hot' and the instrument of measurement was an elbow. We can presumably all accept that one person's 'really hot' is another, presumably more macho, observer's 'warm'. We can see this would inevitably lead to considerable differences in reporting of how reactions might progress, and make predictions about if, or when, they might explode haphazard at best. Likewise we are fortunate that 'looks big enough to me' is not widely used by aeronautic engineers or 'some should be OK' does not form the central tenet of hospital pharmacology.

Yet in effect this is the basis of most

of the vegetation survey we currently conduct. Phase 1 requires an observer to 'judge' whether the area in front of them is one habitat or another. The results of such an approach are superbly demonstrated by Cherrill and McClean (1999) in a paper that should be mandatory reading for all members of IEEM. Comparison of the results of six independent surveyors who visited the same upland site showed that the average spatial agreement between any two maps was only 25.6%. Four or more surveyors only agreed on the classification of 19% of the site and all six only agreed over 7.9%. Would you be happy to accept this sort of disagreement between surgeons as they decided where to operate on you? Yet this is apparently what we expect our clients to accept.

Perhaps we are on better ground with the more detailed tool in the vegetation surveyor's toolbox, the NVC protocol, which has become something of a 'standard'. The NVC is a strange and interesting 'hybrid'. It comprises of course the fixed and rigorous 'rules' for the determination of community or sub-community from quadrat data with which we are all familiar. Indeed these rules are essentially so deterministic they can generally be conducted by algorithm. There would appear to be little room for error with this method *i.e.* the same quadrat data should yield the same community, making it count as a repeatable method. However, this rigour is combined with a field protocol that is nothing but entirely subjective. The surveyor judges in advance where the boundaries between communities lie, in a curious precognition of the results he or she will get from the quadrat data, and then arbitrarily decides to place the sampling quadrats at points that he or she judges are most representative of the community they will then find.

There are two really significant problems with this approach. Firstly, because the sampling is totally biased it has completely side-stepped any opportunity for statistical validation of the results or, just as importantly, any possibility

at all for a valid comparison of change over time. You simply cannot form any rigorous conclusions whatsoever about plant distribution or changes occurring on a site using repeated NVC protocol. You can look at the pictures and make a guess for sure, but let's go back to the hospital staff again, would you rather they had access to full 'bloods', microbiology reports, repeated measurements of blood pressure, pulse, respiration, and temperature *etc.* to decide what was happening to you, or just 'speculate' from the doorway of your ward or via photographs from an adjacent building? Secondly, because the delineation of boundaries or borders to the communities is entirely subjective, the same map will never get drawn by different surveyors, or even to be frank the same one on another day. If you cannot get the same results on the same day (within known errors) you cannot compare over time. It is as simple as that.

Now you might quite rightly want to ask us where are the data to support this claim that NVC is unrepeatable. Well of course there are none. To our understanding there has never been a thorough (or indeed less than thorough) assessment of the ability of



Figure 1. Sample sites at Stiffkey in 2002. Note we are facing south – and about to get our feet wet.

NVC to provide robust or repeatable results by the expedient of sending numerous independent surveyors to the same place and get them to survey the area individually with a check of the outcomes. Yet we are prepared to use the 'data' gathered during NVC surveys to inform decisions, without

any validation of the likely accuracy of these. The medical profession has been busy adopting evidence-based decision making processes for a long time and it is standard for medical practitioners to have to justify, by call to the evidence,

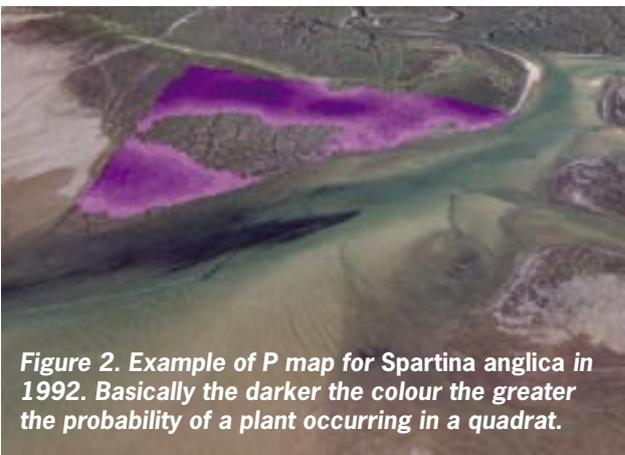


Figure 2. Example of P map for *Spartina anglica* in 1992. Basically the darker the colour the greater the probability of a plant occurring in a quadrat.

that a particular intervention is justified. They have moved well away from the days of old when a consultant like Sir Lancelot Spratt (a reference to the old 1950's *Doctor* film series with Dirk Bogarde for younger readers) could base his work on his own 'expert' opinion and everyone 'jumped'. Medicine is clearly better for it. Does conservation ecology deserve less?

Contrary to what the forgoing might appear to suggest, we are in no way being critical of the NVC system. It was not designed for rigorous mapping or for monitoring and can therefore not be blamed for its inability to fulfil these tasks. Rather we are critical of the way this method is now being used for such purposes by those who should know better. Yes, you probably can 'cut' a piece of wood into two using repeated blows from a lump-hammer if you have to, but if you want to make furniture the results leave a lot to be desired. If you want to quantitatively assess vegetation for mapping or monitor change over time use the correct tools. This is not the NVC.

So what are these tools? Well here we perhaps run into a reason why NVC is used so extensively for something it is not suited to, there are few alternatives 'off the shelf'. Is there any hope?

We have been exploring how two readily available technologies, DGPS and GIS, might be exploited to provide the ability to repeatedly map vegetation (i.e. they get the same result on the same day whoever surveys!) and allow statistical validation of change. Now these may appear to many as new-fangled technologies. However, we cannot indulge ourselves with notions like 'I'm an ecologist I don't understand

these things' any more than a surgeon can say 'I don't understand NMR or CAT scans, I'll carry on feeling the bumps'. We are professionals and we have to adopt whatever improves our practice. After all we can hardly complain that we are burdened by having to learn new things repeatedly like some professions. The quadrat probably dates to the Neolithic (although suggestions that it was a failed and discarded wheel picked up by someone who didn't understand the use of transport because he preferred looking at flowers cannot be substantiated) and we haven't had a lot new since.

How is it working so far? Well, step one is to go back to first year at university, Ecology 101 or something like that, probably first semester ('term', for older readers) when you were exposed to a person who regaled you with lots of truly fascinating statistical facts. These would have included something along the lines that for statistics to be applicable sampling has to be unbiased. This is often taken to mean 'random' although this word is often misinterpreted, as grids achieve the same outcome and allow a more homogenous coverage of a site to be made. We all learned this as absolutely core to how to assess plant populations, and enjoyed throwing quadrats about with gay abandon as a result. Somehow, however, despite all this expensive learning, once we left university we seem to have promptly forgotten it and are now happy to hand draw little pretty pictures on bits of paper and put our quadrats exactly where we want. To hell with statistics, eh?

So our suggestion is simply to use a method that allows us to say whether or not something has changed. The approach we adopt therefore uses a regular grid sample of the site to ensure unbiased sampling. At each point we assess the presence or absence of **all** species present within a quadrat (we don't want to go all holographic laser just yet) and log these data directly into a GPS data logger that simultaneously records the position of each quadrat to sub-metre accuracy. OK, this kit costs a bit but less than most professionals' tools, it is a lot less than the car you drove to the site in – and you save on coloured pencils! Why do we measure presence or absence? Well every assessment of how well ecologists can judge 'cover' or DAFOR (Dominant, Abundant, Frequent, Occasional, or Rare) or any other so-called quantitative measure of 'abundance' shows that we

are about as good at it as playing darts with the wrong hand in a dark room. Research has shown that observer and phenology effects conspire to conceal changes of <20% in percent cover estimates (Kennedy and Addison 1987), and crucially this kind of error is even more apparent for rare species. There is little agreement between observers, or to be honest even the same observer when given the same quadrat a few hours later. So it is spurious evidence – it cannot be relied upon. Presence and absence is the purest measure, it is either there or not. And it is quick, meaning a lot more samples can be gathered. I would like to discuss what 'cover' or abundance is even supposed to mean when considering clonal species like many monocots, but the editor will tell us to get on. I will say though, that any measure of abundance, even if we could all agree that it really is 40% or 'common' is so influenced by phenology for most species it is effectively useless for repeat surveys. So why bother wasting time trying to



Figure 3. Example of P map for *Spartina anglica* in 2002.

guess what it is? Presence or absence is simple and pure and tells us all we need to know. Above all else it requires no judgement by the observer. It is therefore repeatable. Any competent botanist will get the same results – this might be a rash statement so perhaps we'll say any competent botanist **should** get the same result.

Following fieldwork the data are downloaded into a GIS and at this point some of you may want to dim the lights a bit and lie down. To turn point sample data into a map (i.e. a continuous surface) requires some form of interpolation – a mathematical way to fill in the 'gaps' between each point. There are lots of these for use in different applications. However, we want to map fine-scale patterns in our plant distributions and therefore require something called a local interpolator. Again there are lots of these and the decision of what to use is not so immediate. However, we want to remove

arbitrary decisions in our mapping otherwise we are back with the 'NVC problem'. So we want our **data** to determine how the map is drawn. This brings us into the realm of geostatistics.

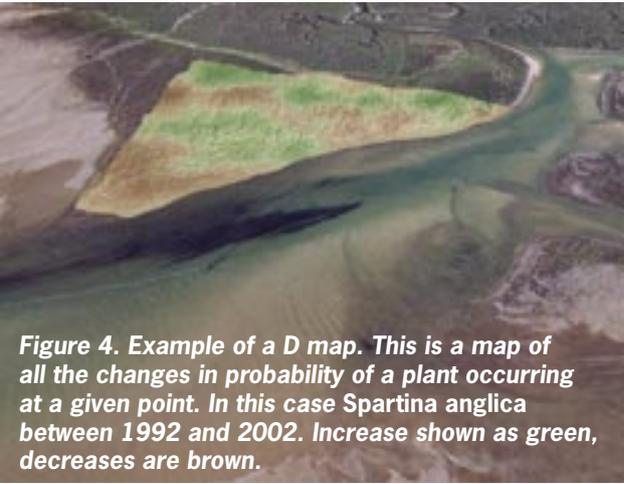


Figure 4. Example of a D map. This is a map of all the changes in probability of a plant occurring at a given point. In this case *Spartina anglica* between 1992 and 2002. Increase shown as green, decreases are brown.

This branch of spatial statistics as its name implies was first developed to help map density of mineral ore (could be plants) from borehole sampling (could be quadrats) for the mining industry (could be us). Sadly there is not space here to discuss the details of the mathematics and spatial statistical theory but suffice it to say that the nature of the data, e.g. is the plant patchy and sparse or continuous and 'even' across the site determines how the mapping process is executed. Remember we only collected presence absence data so we only 'feed' 0/1s into the analysis. The map we generate from this shows the probabilities of a plant being there. Don't recoil in horror, this is actually incredibly simple, it is the chance that we would find a given species in the quadrat at a given point. When you think about it like that it is very intuitive. If I put a quadrat over there what is the chance this species will be in it.

What results can be gained using this method? Figure 1 shows the sampling grid as applied to an approx 14 ha area of salt marsh in north Norfolk (OK, as I use DGPS and GIS I do know this to half a gnats crotchet but I couldn't be bothered to type lots of numbers). Ignoring the section of the west of the image (right as we are standing in the North Sea here and looking south!) which was sampled at a higher density for another reason, you can visualise what a 10 m sampling grid looks like on the ground. No attempts were made to follow rigorous straight lines – simply pace 10 m in the right direction, stop and put the quadrat down. Remember at each point we datalog presence/absence of every species and spatial location to sub-metre accuracy. Figures 2 and 3 show examples of the probability maps - note we now use

the abbreviation P-map to avoid saying probability all the time. Now these maps only solve some of the problem, yes we can map the distribution of all the plants present on a site, and do that with estimates of how accurate they are, but how do we assess change over time? Well at one level this is extremely simple. We can subtract the two maps from each other – this will create a map of differences or change. Figure 4 shows an example of this, and by now you have probably guessed we call these D-maps as a short-hand for difference maps.

When we first thought of looking at such a method we wanted to avoid the time-consuming task of having to revisit each sample during subsequent surveys. It is pointless spending time re-locating the location of earlier samples if you don't need to. So our approach is simply to execute each survey using the same general method, but not bother to locate where the earlier samples were. This saves time and time means more samples. However, it means there will be lots of little differences between P-maps arising from differences in location of samples between monitoring periods. Therefore we statistically threshold the D-map (using a series of random maps – but we cannot go into this here) to show only those areas where we are 95% or 99% confident that change has occurred. As Figure 5 shows this creates a map of areas where the plant tested has significantly increased or decreased. Oh, and we call it a C-map for confidence thresholded map.

So by using these two fairly new tools (frankly engineering surveyors have used these for years already) it is possible to produce maps repeatedly, free from surveyor bias or subjective impressions. The data gathered allows you to do 'conventional' statistical analysis of changes by comparing frequency of occurrence for each survey, so you really know if the population has changed. And the maps produced can show where the plants were, where they are now, and where significant changes in the population have occurred.

Of course as we collect data from all the species present over the entirety of a site we produce maps of every species present including obviously rare species and indicator species. Imagine the possibilities of using these sorts of data combined with Ellenberg values to map changes in say pH etc. across a site and over time.

Still want to draw lines on a map where you think a community changes, and hope the next surveyor makes the same guess, or not of course if something has changed, how would you know? Then collect data that are statistically useless? It is simply a choice of subjective impression and essentially guesswork versus objective statistical evidence. Which do you think will be more defensible if you are challenged in court to defend your statements if something goes wrong?

Please accept that this article has been written to engender debate and, hopefully, contemplation, amongst us all as practitioners of the 'black art' of vegetation survey. The style is sometimes deliberately argumentative, please join in with this approach and do not take offence! The views expressed are solely those of the authors and not

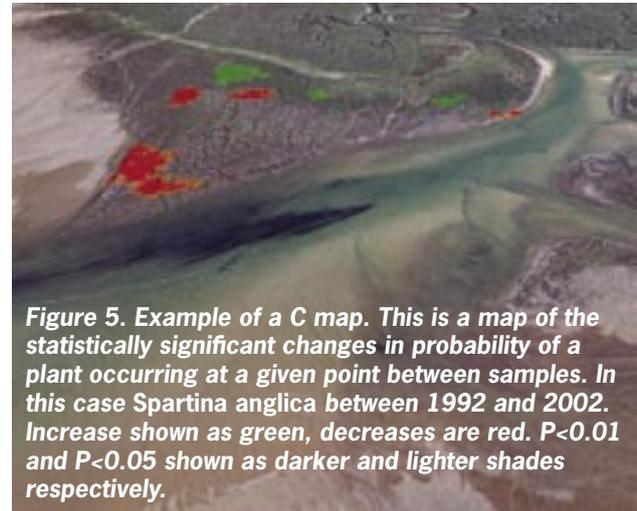


Figure 5. Example of a C map. This is a map of the statistically significant changes in probability of a plant occurring at a given point between samples. In this case *Spartina anglica* between 1992 and 2002. Increase shown as green, decreases are red. $P < 0.01$ and $P < 0.05$ shown as darker and lighter shades respectively.

necessarily those of IEEM or any other body. The IEEM is currently considering reviewing its guidance on methods in ecological survey and would welcome your feedback as suggestions such as these.

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Using Wildlife Data from the NBN

Mandy Henshall

Information and Communications Officer, NBN

In June 2006, an article appeared in Issue 52 of *In Practice* which drew attention to the National Biodiversity Network (NBN) and its data search website, the NBN Gateway. That article detailed what the NBN is, what it does, and how it works; and we reported that, at that time, the NBN Gateway facilitated access to over 20 million species records. One year on and there are now over 25 million records being shared through www.searchnbn.net - a great achievement. This, however, only scratches the surface of the amount of wildlife data thought to exist. The NBN Gateway currently provides an easy point of access to a very large amount of species data for the UK, but it is far from comprehensive; indeed 25 million records is probably less than 5% of existing data! The NBN initiative is working hard towards including more of this data, which will in turn see the Gateway realise its aim fully to become the easiest way to access a more complete range of existing UK biodiversity data.

It is important that whilst celebrating the strengths and achievements of the NBN we bear in mind its current limitations and the work still to be done to realise the Network's full potential.

Data available through the NBN Gateway are an invaluable resource for anyone doing a search for conservation or development. The site should be seen as an essential source for anyone in consultancy or conservation organisations. The data held can be searched at many different levels, as the NBN Gateway allows you to view distribution maps and download data by using a variety of interactive tools. For instance, you can look for species data at a variety of scales of resolution using an Ordnance Survey grid map of the whole country, or you can focus on one of the vice counties. All publicly available records are available at least at 10 km

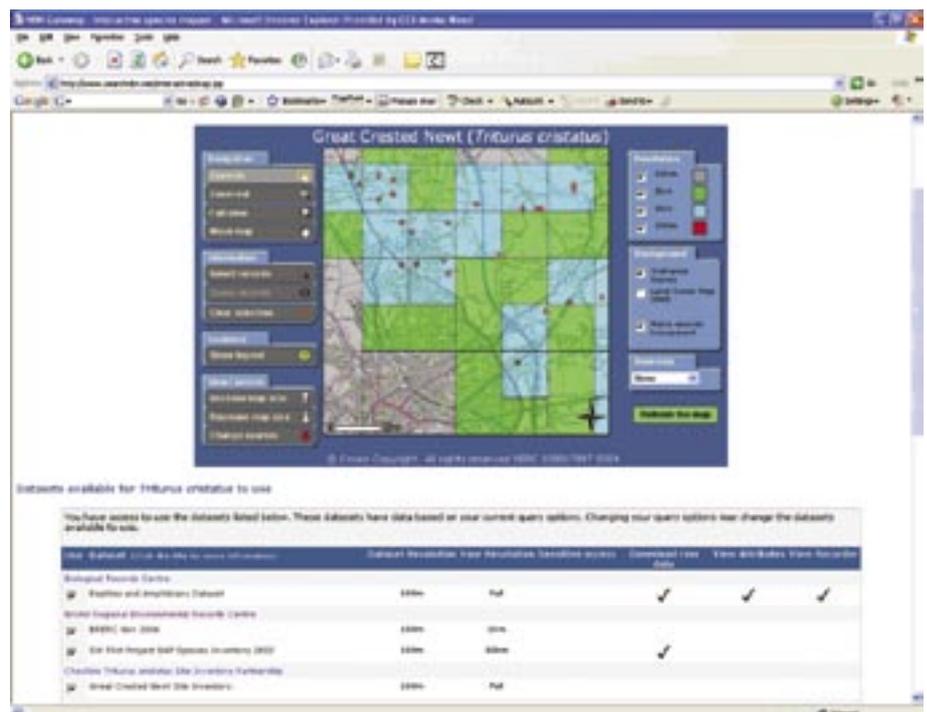
scale and many at 2 km or 1 km. Some are also available at 100 m resolution (and the underlying database may hold the records at an even better resolution) although you may need to register and arrange enhanced access to see this detail. Registering is a **free** service and can be easily done from the home page. Access to all the datasets held on the Gateway is individually controlled by the data providers, but requesting enhanced access to a dataset is a simple process and most requests are handled within 28 days, usually less. The NBN Gateway service is free, but there are Terms and Conditions to be adhered to, with one of the key factors being that the data providers must always be credited in any use of them.

As mentioned above, the data provider has full control over the access rights of the data and some only allow access at 10 km level for a variety of reasons. One common reason is fear of the data being misused in some way. Some data holders are not yet willing to share their data through the NBN Gateway because of this concern. This very fact means that whilst the NBN Gateway holds a huge amount of information it isn't exhaustive. If a species doesn't appear in a particular area on the NBN Gateway

it may either mean that it hasn't yet been recorded or, if so, the data may not be being shared with us, rather than that it does not actually occur there.

The NBN Trust's Data Exchange Principles state that biological data should be placed in the public domain for not-for-profit use wherever possible, but we understand the concerns around doing this and are therefore working closely with interested parties to address these concerns wherever we can. One fairly simple way we are doing this is by making the Terms and Conditions for using the NBN Gateway and its data more obvious on the website.

The Data Exchange Principles also recognise that users should expect to contribute to sustaining the collection, collation and management of the biological data, without which none of this data would reach the NBN Gateway. Local records centres (LRCs), in common with many other data contributors, require the security of a long-term sustainable funding base in order for them to meet their users' needs. They currently depend on at least their principal users contributing financially to the costs associated with data collation and management (often



Screenshot taken from the NBN Gateway showing distribution of the Great Crested Newt (*Triturus cristatus*) in Cheshire using the interactive map.

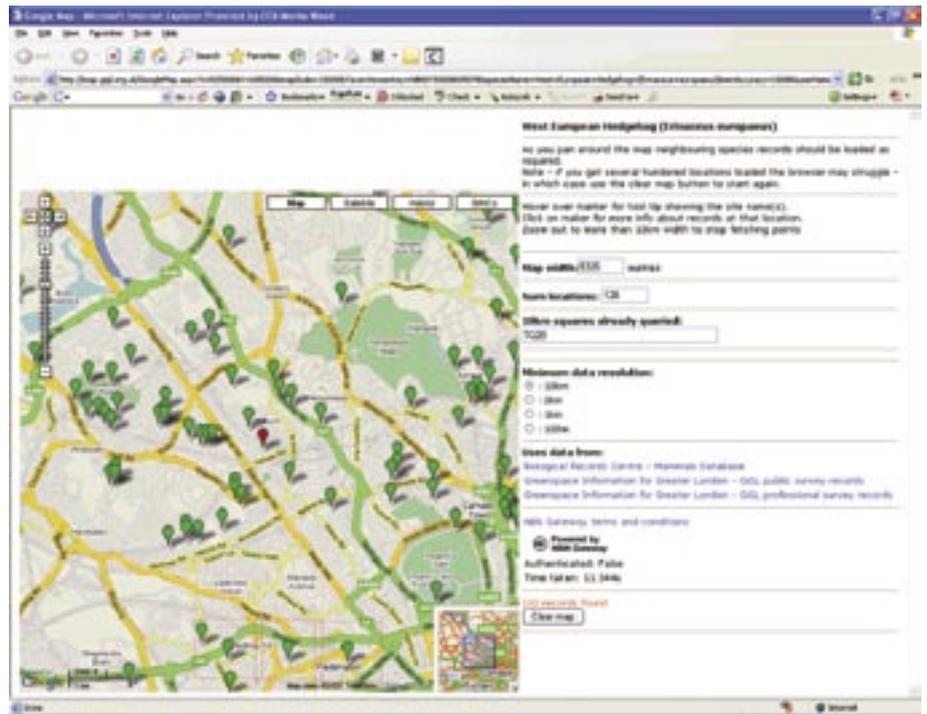
through service level agreements). Many of them also rely to some extent on the supply of at least some of their detailed data (in agreement with their own data sources) to commercial organisations, for which they charge a fee, and some of them have been wary of making all their data freely available for fear of losing this sometimes vital source of extra income. Interestingly, though, there is so far nothing to suggest that putting data onto the NBN Gateway has affected this source of funding, quite the contrary. Close working with LRCs, coupled with understanding their needs, allows the NBN to draw attention to and help data suppliers disseminate huge amounts of data.

So, if you have not already explored the NBN Gateway, you now know that a large amount of data are available, but can they be accessed at the level you need and will they give full coverage of the area you are interested in? This will all depend on what exactly you want, and how you go about finding the data you need. It might therefore be useful if we gave a couple of examples to show what is available, and how access to it has been arranged.

Ecological consultants will know only too well the importance of those species with Biodiversity Action Plan status, and just over a year ago, the Gateway saw the loading of an important and major dataset concerned with the great crested newt in and around Cheshire.

United Utilities PLC needed to mobilise their data, partly as a response to the Environmental Information Regulations, but, as funding from a development mitigation programme was available, it also allowed them to collate data from third parties. In partnership with rECOrd, the Cheshire and district local records centre, English Nature (as was) and the Cheshire Wildlife Trust, Liverpool John Moores University managed the project for United Utilities, which resulted in a dataset of over 1,000 records. This in itself is not a huge dataset in terms of the NBN Gateway, but what is important is that it includes data from all the partner organisations, as well as other contract data from consultancies. As such, it represents nearly all the known data so far available for this protected species from the Cheshire region, which is a major focal point for the species in Britain (and Europe).

This project is important for the fact that this is the first time that a public utility company had made use of the Gateway in this way, but perhaps the most important aspect is that the data partners have made this data freely available to all at 1 km resolution on the Gateway, and in full detail to anyone,



Screenshot from the Greenspace Information for Greater London website, which is powered by the NBN Gateway, showing distribution of the west European hedgehog (*Erinaceus europaeus*).

including commercial consultancies, as long as these users reciprocate by making their data freely available in the same way. The NBN Trust (the body facilitating the Network) regards this as an important step. It offers a challenge to all those who might want to hold on to their data to consider that it might be in their best interest, as well as to others, to make this as freely available as possible.

Following the loading of the dataset it was interesting to consider the distribution and occurrence of the great crested newt across Cheshire. Previously, rECOrd had had what looked like a good coverage of the species from a whole range of sources. These newly acquired data from commercial sources, quite clearly showed just how many more sites with the species were out there. Furthermore, the data carried in the inventory data set relate only to records for ponds which can be precisely located with 12 figure OSGB (Ordnance Survey) grid references which are supplied as part of the downloadable data. This makes the data additionally valuable to field workers and consultants. In addition to locational data and dates of survey, the data include survey methods used, capture figures, evidence of breeding, population estimates where available, data relating to the pond and surrounding terrestrial habitat and potential or actual protection afforded the site by ownership or conservation designation. At the same time, the survey data also showed quite clearly where special studies had been

carried out for specific purposes – new pipelines, roads etc., suggesting that further survey would no doubt prove even more occurrences.

This project showed the power of the NBN Gateway to make available even these highly detailed data, with many associated attributes, so they can be best used by others. It also showed that no single source of data can ever hope to have all the information about a particular species, even one as well-studied as the great crested newt.

Of course, even for reptiles and amphibians, the Cheshire data set is only one of several that are available through the NBN Gateway. We are beginning to get datasets from other local records centres that include such data; and we also have the Herpetological Conservation Trust's (HCT) own dataset of rare species available, which has detailed data, often down to 1 m resolution, although public access is limited to 1 km. Obviously, these data are highly sensitive in some cases, and public access to the detail is therefore restricted. However, the HCT is keen for data to be used, and encourages applications from users to gain access to full details, upon supply of a reasoned request to them.

The HCT has also highlighted clearly one other major issue with data available through the NBN Gateway and elsewhere, namely that such data need to be approached with care in their interpretation. The NBN Trust has always tried to make it clear to users

of the NBN Gateway that the absence of a record for a species in a particular locality does not necessarily mean that the species is absent. The age of data needs to be judged cautiously – maps generated through the NBN Gateway may include all data from the beginning of recording, unless the user chooses what they want to see carefully. It will also show data from all datasets currently available to a user, depending on whether or not they have both registered on the NBN Gateway and logged on, or not.

Each dataset comes with 'metadata' that should highlight potential problems about the way the data can be legitimately interpreted. This is a key issue that the NBN Trust wants to emphasise. It is essential, especially if users want to use the data for assessing the impact of human activities, or for other conservation-related purposes, that they understand what the data actually signify. These can include the source of the records they are gaining access to; the implications for interpreting data of the methods of survey that were carried out; the level of accuracy of identifications; and the timespan over which the dataset

was collected. Data collected for one purpose, such as a distribution atlas may not be much use in judging the abundance of a species in relation to a particular locality or region, for example.

A final example might be the data now being supplied from just one of our local records centres direct – Greenspace Information for Greater London (GIGL). They provided two datasets – one from public surveys, the other from more specialised surveys earlier this Spring, as part of a major project that enabled them to mobilise their own 500,000 records, as well as to work with a major local society, London Natural History Society, to make some of their data available too. The result is a large addition to data available for London, including key data on protected species, flora and dragonflies. GIGL's own dataset included data that the Centre regularly uses to respond to enquiries from consultants working on developments, so it was important for GIGL that full access to their data had to be controlled. However, the NBN Gateway has enabled them to showcase their data, and make it clear to potential users when they might, or might not have data that are of specific use in a

particular case. Having also ensured that these sorts of sensitivities were handled carefully, data from the London Natural History Society have also added to the pool. These in particular include well-authenticated data from highly competent recorders, and so GIGL has enabled high quality data to be made use of both for local analysis, and more widely.

Through close working with all the Network partners, the NBN Trust understands the concerns of those involved in biological recording and the subsequent users of the data. We are actively seeking the most up to date data to give full UK coverage, but we also accept that this is some time off. In the meantime we are encouraged by the increasing number of organisations which see the Gateway as **the** means of sharing their data and by the number of consultancies and ecologists who realise that it can be invaluable in assisting their work. With this in mind, we look forward to facilitating beneficial data sharing relationships between data providers and users now and in the future.








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Letter to the Editor - The Skills Project

Dear Sir

I have just read the IEEM E-Newsletter No.5 and was particularly interested in your section about the skills project. This skills gap relating to the provision of qualified ecologists and environmental managers was also mentioned at the IEEM Spring Conference in April, and I have to say that, from my perspective (and many friends in a similar position), I find this situation rather strange.

I have been looking for a position as an assistant ecologist for quite a while now, but have not had much success. I have a BSc in Biology, MSc in Environmental Sciences (specialising on water voles) and MPhil in Biology/Ecology. I have also published a scientific paper in a peer-reviewed journal, plus undertaken several IEEM and Field Studies Council courses on protected species (e.g. bats and great crested newts) and habitat surveys. Most of all I am professional and enthusiastic, and keen to apply the skills that I have learnt (I am also bilingual). Although I have been called for several interviews, these have not led to anything, because each time, the position (the assistant ecologist position) has been given to someone who had more 'experience' than myself.

Although I can see why organisations prefer, and have a need to, employ experienced ecologists, how do people in my situation ever stand a chance?! Many graduates and people like me, who are working in a job where they are not much involved with field work (although still working in the environmental arena) but have many other skills that they can offer (plus a pretty good background in ecology and the right mindset and awareness of commercial and business issues) are finding this situation more and more frustrating.

I don't think there is anything wrong with the current curriculum (as some would say) but rather with the industry.

Firstly, I would really like to see a stop to 'volunteering is great and is something that employers look for'. Please, do people realise how much studying costs?! Not mentioning postgraduate degrees! Do employers know that only (some) undergraduates get grants and bursaries for studying, and that there are no grants (or very few, apart from research councils and sponsors) for postgraduates. Therefore, postgrads (who choose to do an MSc or MPhil because they are actually more tailored and geared towards specialist areas) have to take professional

development loans that they will also have to pay back. I think that employers should really start to appreciate that people cannot afford to volunteer all the time and not get any paid work, it just does not work. How does a person live with no salary and a backlog of debts created because they want to do something worthwhile with their life?! To put it bluntly, too many organisations use volunteers as slaves, and it is unacceptable, especially for people in my situation who have worked extremely hard to get a degree and a career in this field, only to be continually knocked back.

Secondly, surely, in-house training has many advantages, such as training the employee to the company's standards, assessing the person's capabilities before giving higher responsibilities, lower wages to pay etc., and if given to the right person, training would not actually take that long! In any case, most employers expect assistant ecologists to already have a multitude of skills *i.e.* protected species licenses, plant and animal identification (to at least Phase 1 Survey level), along with analytical skills, report writing, GIS, knowledge and understanding of the legislation, etc. It is a lot to ask and they do need to realise that they have to train people themselves to get what they want. Only some of these skills can be acquired through a university degree. You might be interested to know that university courses in the environmental sciences are now geared to give students a broad-based education in a number of areas in order to give them breadth of knowledge and train them to be adaptable, so they can in turn learn new areas and skills quickly and efficiently. Universities concentrate on giving graduates a wide skills base rather than a narrow set of skills which could restrict their employability. In fact, universities expect employers to train their high calibre graduates to their specific needs.

I think that the only way you can learn something properly is by actually applying it to a job, if only someone would give you a chance!

I apologise if this letter is on the negative side, but I have been talking to many people who share these views, so I think it is time the industry is made aware of how their potential future employees feel.

Thank you for your time.

C. Delgery, BSc MSc MPhil AIEEM
(and a member of the local Wildlife Trust and RSPB)

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Dr Andy Tasker, Chief Executive

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IEEM Spring Conference 2007

Nick Jackson AIEEM

Education and Professional Development Officer, IEEM

Professor Max Wade opens proceedings.



The IEEM's spring conference took place on 18 April 2007 in London and was IEEM's most successful one-day conference to date, attracting 250 delegates. The topic was obviously a very popular one as the conference became fully booked very quickly (we even had a waiting list of 120 people – so if you are thinking of coming to a future IEEM conference then don't

hang about - get your booking in as soon as you can to avoid disappointment!)

The title was 'Developing Best Practice in Survey and Reporting' and the aim of the conference was to inform ecologists and environmental managers of the best methods for surveying different habitats and species.

Professor Max Wade (an IEEM Fellow) gave the opening address and posed questions such as "what could we do better?", "where are the gaps in our knowledge?" and "how can we achieve even better 'best practice'?"

Hilary Ludlow followed with a talk on tendering for surveys. Hilary outlined the need to promote and maintain a high level of professional competence whilst not pricing yourself out of the market. She also spoke about the factors to consider when tendering, such as competition, legal and financial implications, professional recognition and leaving a clear audit trail.

The next session was made up of six speakers each having 10 minutes to talk about surveying specific habitat types (coastal, freshwater, marine, grassland, peatland and woodlands were covered). Each presentation considered the key issues for each particular habitat, including common mistakes, and false assumptions made when surveying. This was followed by a 30 minute discussion session.

Before the break for lunch, Jacqui Green announced the launch of IEEM's Sources of Survey Methods website. This is an invaluable resource, which clearly lists the established and generally accepted methodologies for field survey. It is expected to expand as further references are added and if you know of any texts which should be referenced on the website and are currently not listed please let IEEM know. The website can be found at www.ieem.net/survey-sources/index.html.

The afternoon session started with another set of six speakers with 10 minutes each to talk about surveying specific species groups (marine, invertebrates, lower plants, higher plants, herpetofauna and small mammals). The format was the same as the session before lunch,

with each presentation considering the key issues to be taken account of, for each particular species group. This was followed by a 30 minute discussion session.

Alan Feest from Bristol University spoke next about getting the best out of sampling data. His presentation compared two approaches to surveying and showed how data can be collected and analysed to save time and money and meet the needs of the client.

Andy Cherrill from the University of Sunderland followed with a talk on metadata, which is the information necessary to understand and effectively use data, including documentation of the data set content, contexts, quality, structure and accessibility. Andy outlined the benefits of metadata and asked the question "do we need metadata standards endorsed by IEEM?"

The final speaker of the day was Mike Oxford who was representing the Association of Local Government Ecologists (ALGE). He spoke about the importance of ecological information and gave delegates information about the new web-based biodiversity toolkit for planning, which is due to be launched shortly.

Professor Wade summed up at the end of the day with a few ideas about how we can all improve our surveys:

- careful, well informed tendering;
- spending more time on planning and less on wasted effort;
- taking a pragmatic approach;
- quality assurance – exchanging reports;
- setting competence levels for staff undertaking surveys;
- providing/insisting on appropriate training;
- collection of ancillary data;
- increasing replication to respond to habitat variation;
- undertaking research and development; and
- extending the scope of surveying, e.g. to cover lower plants and invertebrates.

The full papers from the conference are being published as a supplement to this issue of *In Practice*. I would like to thank all the speakers for their contributions and making the conference the success it was.

IEEM's next conference is taking place on 13-15 November 2007 in Nottingham and will be on the subject of ecological networks and connectivity. A draft programme is now available to download from the IEEM website (www.ieem.net).

Conference delegates.



Institute News

Who's Who in IEEM 2007?

Apologies to Greg Carson for being left out of the list of Council Members and their contacts in the last edition. The item should have included: Dr Greg Carson, Associate Ecologist, White Young Green Environmental, greg.carson@wyg.com

IEEM on the Move

Well, actually we are still at 45 Southgate Street but not for very much longer. Negotiations, surprise, surprise, have taken much longer than anticipated and a final announcement will be made via an e-mail sent to all members.

Staff Changes

I am pleased to report that Gemma Langdon-Saunders, after undertaking a SAGE training course has been promoted to Finance and Administration Officer and will now handle much of the IEEM accounts, administration and project development work. A new position to ease the administrative load and to support the growing needs of the Geographic Sections is currently being advertised.

In Practice Editor

Jason Reeves has become the new Editor of *In Practice* justly reflecting the reality of recent editions. Jim Thompson steps down after being the Editor for 30 editions starting in June 1999. *In Practice* has developed hugely in that period with the key changes being the move away from the blue print and monochrome photos to black print and colour photos and, in the last year, the move to a new design developed by Nigel Barker in consultation with Jason Reeves. This seems to have been well received by members. The number of pages per edition is now over 40 compared with a usual 20 a few years ago. The flow of articles is now also much stronger than previously, partly because we now have a theme for each edition, known well in advance.

Membership Issues

There have been some small changes in the Membership Regulations recently approved by Council. These are that sponsors need to be at least at the grade of membership that they are sponsoring - in other words a Full Membership application for example cannot be sponsored by a Graduate.

The second change is the publication of applications - up to now confined entirely to *In Practice*. The new procedure is that applicants' names will be published in the E-newsletter or *In Practice*, whichever is the closest to their date of application. There is now only a tiny minority of members who do not have e-mail access and we find that responses to the E-Newsletter are sometimes more frequent than *In Practice* so we feel confident that the necessary and vital scrutiny of new applications will be maintained whichever means is used. This will apply to applications received after this *In Practice* goes to press. The current procedure of publishing the names of those

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recently admitted to the Institute will continue in *In Practice*.

There are now about 160 Graduate Members of IEEM, which is a very welcome sign that newly qualified people are joining in large numbers. Those who now have sufficient relevant professional experience for Associate Membership should apply to upgrade. There is a special form for this (currently available by request) which should be on the website very shortly.

All members except students are encouraged to pay their subscriptions by Direct Debit and for some grades of membership there is a useful saving. Anyone wishing to pay next years subscription by Direct Debit should return the completed form to IEEM by 1 August. This form can be downloaded from the members' section of the website.

Consultations Update

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

- Environmental Liability Directive - A Consultation (Scottish Executive)
- Options for implementing the Environmental Liability Directive (DEFRA)
- Review of Registration under Section 7 of the Wildlife and Countryside Act 1981 (DEFRA)

IEEM Campaign on the Environmental Liability Directive

The transposition of the Environmental Liability Directive into UK law - to no one's surprise has not yet happened. Instead we have the Environment and Rural Affairs Commons Committee undertaking a new style of inquiry into DEFRA's implementation of the Directive.

The Committee will consider in particular:

- What consultations DEFRA has had on the Directive since it was adopted in 2004 and with whom, and whether DEFRA has listened to consultees' views. Why DEFRA has taken so long to consult formally on the ELD. Whether any important questions were omitted from the formal consultation.
- What discretion Member States have in the implementation of the ELD, and the reasons for DEFRA seeking to apply the 'permit' and 'state of knowledge' defences under Article 8 (4). Which other Member States will be imposing strict liability to a wider range of activities than is DEFRA, and which are applying a more sensitive test of damage.
- Why the Government is proposing to limit the scope of the ELD to EU-protected biodiversity, and which SSSIs would be affected.
- What effect implementing the ELD in the manner proposed by the Government is likely to have on its meeting the 2010 targets under the Biodiversity Action Plan and its PSA target to bring 95% of nationally important wildlife sites into favourable condition; and whether the ELD may take resources away from achieving these targets.
- The timescale for implementation of the Directive.
- The capacity of organisations such as the Environment Agency, Natural England and NGOs to take action under the Directive.

It will indeed be interesting to see what conclusions are reached.



IEEM Fellows

Council at its meeting on 8 March approved four new Fellows bringing the total up to 23. These were:

Dr Nick Carter

Nick Carter is the Director of Development for the British Trust for Ornithology (BTO). He has played a particular role in

promoting the BTO's involvement in three important areas of applied ecology: the use of farmland by birds in winter, the significance of organic farming for wildlife and the potential impact of windfarms on birds. Nick has been a member of IEEM since 1993 and has been a Council member for the past four years. He has numerous publications both in the scientific and popular press.

Dr Philip James

Philip James is a Senior Lecturer in the University of Salford in the School of Environment and Life Sciences. He has been a member since 2005. His publications particularly focus on combining ecology, sociology and economics to present new insights. He has contributed to the development of the Ecological Network for Cheshire, a major EWU-Life funded pilot project. He has worked on projects in China, Japan, Malaysia, Columbia, Ghana, Finland and Italy and is visiting professor at East China Normal University.

Dr Stephanie Wray

Stephanie Wray is a founder and Director of Cresswell Associates which has recently become a Hyder Consulting Group company. Stephanie is a Chartered Environmentalist and has been a member since 1994 and sits on the External Affairs Committee. She has numerous publications with particular interest in highway schemes in which capacity she has appeared as an expert witness on many occasions. She has prepared biodiversity action plans for both the Highways Agency and Transport Wales.

Mr Richard Nairn

Richard Nairn is an environmental scientist based in Wicklow. He has worked for the National Trust, Northern Ireland, the Royal Irish Academy, Dublin, the Irish Wildbird Conservancy, as an independent consultant and currently as Managing Director of the consultancy firm NATURA. Richard has a comprehensive knowledge of Irish conservation issues. He is a Founder member of IEEM and was one of the instigators of the Irish Section of IEEM, acting as its first Convenor.

Applications to become new Fellows are beginning to flow more readily once people overcome their modesty. We have

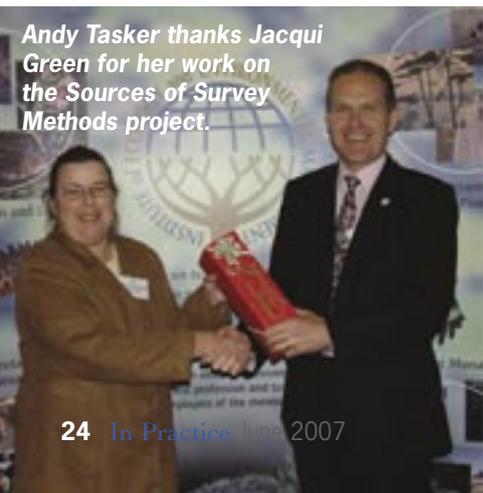
had a few requests from people wishing to sponsor individuals and that is to be welcomed. In the end though, the only real way in which an application can be judged is if the individual prepares the necessary CV and other background information. Anyway, there are positive signs that momentum is starting to build so please keep the flow going.

Occasions like major conferences are good opportunities to present Fellows' Certificates. Andy Tasker, IEEM President, did the honours at the recent London Conference and the recipients were Max Wade and Kathy Dale, both Fellows for some time and Jeff Kirby, whose application was approved at the meeting of Council last December - congratulations!

Sources of Survey Methods - Website

Many IEEM members will be aware of this long standing interest of IEEM and may have attended the conference in Birmingham in 1997 entitled Standards for Survey – Getting the Right Balance. The London Conference in April this year saw the official launch of the website version and was the culmination of work extending back to before the Birmingham Conference and led by Jacqui Green. Jacqui was presented with a small gift in recognition of her efforts in this field.

The preliminary work to compile a list of references and sources of information of survey methods, has finished. The resulting section of the IEEM website is intended to be a first port of call for information about the methodologies which are currently in most common usage, and about which members would be expected to know in their chosen specialities. Although there are problems with and deficiencies in many of the mainstream methodologies, they are the ones which are most in use or which otherwise have official sanction from, for example, JNCC. As these methodologies, and therefore also the references, will change over time, and new ones will come to light, the website now has a feedback option. Please use this to supply information about any corrections, omissions, additions and especially to keep it up-to-date with new developments. You can find the web page at: www.ieem.net/survey-sources/index.html.



Andy Tasker thanks Jacqui Green for her work on the Sources of Survey Methods project.



Biodiversity in the New Forest

This meeting is being held in support of the recent designation of the New Forest as a National Park. It is being organised by Bournemouth University in association with the British Ecological Society, The Forestry Commission and the National Park Authority.

The objective is to provide a forum for both naturalists and ecological researchers to present current information about biodiversity in the New Forest with the aim of informing future management decisions and identifying particular issues of concern.

The meeting is open to anyone with an interest in the biodiversity of the New Forest.

For further details and registration:
 Conservation Sciences, Talbot Campus,
 Poole, Dorset, BH12 5BB
 email: csconferences@bournemouth.ac.uk
 tel: 01202 965160 fax: 01202 965046
www.bournemouth.ac.uk/conservation

North East England Section News

IEEM North East Section Conference: The Ecology and Management of Grasslands in North East England, 2 April 2007.

Richard Jefferson CEnv FIEEM, Andrew Cherrill CEnv MIEEM and Steve Pullan CEnv MIEEM

The IEEM North East England Section held a one-day conference at the Natural England office in Newcastle on 2 April 2007.

This was attended by 73 delegates from a wide range of sectors including ecological consultancy, statutory agencies, local government, non-governmental wildlife conservation charities, universities and National Park authorities. Of the delegates, 55% had some form of IEEM affiliation.

The topics covered by speakers covered overviews of the nature, distribution and conservation status of semi-natural grasslands in the region, grassland habitat management including restoration and recreation, management of inbye grassland for breeding waders and threats to and opportunities for grassland conservation. The speakers were drawn from the University of Newcastle upon Tyne, Northumberland Wildlife Trust, the Durham Biodiversity Partnership, Natural England, RSPB, the North East Community Forests Grazing Animals Project and the North Pennines AONB Partnership.

The North East Region is particularly important for its resource of upland hay meadows, Magnesian limestone grasslands and grasslands associated with heavy metal-rich soils on river gravels and the doleritic Whin sill. In addition, the North Pennine AONB is of both national and international significance for its upland breeding wader assemblages.

The following key messages can be drawn from the various presentations:

- semi-natural enclosed grasslands are a scarce and fragmented resource threatened by lack of management, agricultural improvement, inappropriate grazing regimes and development (housing, mineral extraction, etc.);
- in particular, apart from more global issues such as climate change and atmospheric nutrient deposition, neglect and the difficulty in re-instating grazing was the most common issue alluded to. This is a major reason for the poor condition of sites, particularly those with no statutory protection;
- there is a lack of public awareness of the cultural, aesthetic and scientific importance of semi-natural grasslands and a need to encourage greater public engagement in their conservation;

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- grassland creation is normally dependent on the introduction of seed/hay from existing donor sites which in some areas may be scarce. Recreating species-rich swards normally takes time – probably a minimum of 20 years;
- key factors that may limit the suitability of upland inbye grasslands for breeding waders include disturbance from machinery operations between mid-March and mid July, overgrazing, low water tables and obstructions which may reduce visibility. The RSPB Pastures for Plovers project is providing management advice to landowners to ensure the maintenance and expansion of wader populations in the North Pennines AONB;
- further research is required to inform the management of grasslands - in particular understanding the role of the soil microbial community in the restoration of grasslands; and
- short-term funding is hampering the effectiveness of projects aimed at ensuring the long-term conservation of semi-natural grasslands.

The IEEM North East England Section is grateful to Natural England for hosting the conference and to the speakers who made the event a success.

Future regional conferences are planned. Members are invited to contact the regional committee with suggestions.



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Irish Section News

News

This column is intended to be a noticeboard for news and information relevant to IEEM members in Ireland (north and south). The Irish Section was established in early 2005 and held its first AGM in October 2006. The organising committee meets four times a year and an interesting programme is planned for the coming year. Any members who would like to help with events or require other information may contact the secretary, Pascal Sweeney at pascalsweeney@eircom.net.

Workshops in Ireland 2007

The following courses are planned for this year and others are in preparation for 2008. Each of these courses qualifies as Continuing Professional Development (CPD) for members of IEEM.

Monday 2 April 2007.
Forest structure for restoration management plans.
Galway.
Instructor: Sasha Bosbeer.

Saturday 19 May 2007.
Freshwater crayfish survey methods.
Kildare.
Instructor: Dr Julian Reynolds.

Friday 8 June 2007.
Habitat mapping: field and office.
Wicklow.
Instructors: Katharine Duff, Richard Nairn, Matt Hague.

Contact: Nick Jackson at nickjackson@ieem.net

Irish Conference 2007 – Advance Notice

Theme: Irish Biodiversity – What's the situation now?
Date: Monday 15 October 2007
Venue: Dublin (details to be confirmed)
Session 1 - Overview of biological data collection and status reports.
Session 2 - Short presentations on status of variety of habitats and species.
Poster sessions and abstracts to include links and references.
Contact: Faith Wilson at wilson@esatclear.ie

Nature Photography Event

The Irish Section will be organising an event in Cork in November 2007. This will include an illustrated talk on Nature Photography, an exhibition of members' nature pictures, followed by evening dinner and socialising. Further details will be available in the next issue of *In Practice*.

E-mail Addresses

From time to time, there is a need for the Irish Section committee to contact Irish members directly, for example, to notify them of changes to events advertised elsewhere. Due to data protection constraints, members' email addresses can only be used for this purpose if they have given their written permission for this. We also need to know that the email addresses we are using are up-to-date. If you are not receiving information on Irish events, this may be because IEEM does not have your latest email address or has not received permission to use it. In either case, please inform IEEM head office at enquiries@ieem.net of your current address and please give your written permission for it to be used by the Irish Section committee.

Irish Biogeographical Society

The IBS has been consistently publishing an annual Bulletin of papers on subjects of Irish natural history interest. Bulletin No.30 is now available in addition to a series of occasional publications and a new development called the Macro Series. Among the latter is An Annotated Checklist of Irish Butterflies and Moths. Details of membership (very reasonable

at €15 or £10 per year) are available from Dr Jim O'Connor, National Museum of Ireland, Kildare Street, Dublin 2.

Irish Wildlife Manuals

This series of very useful manuals is published by the National Parks and Wildlife Service. Many of the titles are available as downloadable PDF files on the website www.npws.ie. Among the recent titles are:

- *The National Otter Survey of Ireland.*
- *Guidelines for Bat Mitigation in Ireland.*

Irish Birds

The annual scientific journal *Irish Birds*, published by BirdWatch Ireland, is now into the first issue of Volume 8. The journal was established by the late Clive Hutchinson in 1976. The new issue contains papers on the 2005 national survey of hen harrier in Ireland, a review of 35 years of population changes in waterfowl at Ballycotton, Co. Cork, an illustrated paper on the scavenging of fallen seabird eggs by marine invertebrates, and many other interesting items on Irish ornithology. Copies are available by mail order from BirdWatch Ireland, www.birdwatchireland.ie.

Irish Articles Needed

Any members who would like to contribute articles on Irish issues to *In Practice* should contact Richard Nairn, who will co-ordinate this with the editors of the magazine. Especially welcome are short news items on new environmental developments or items of biodiversity interest in Ireland (north and south). Please send any contributions, long or short, to Richard Nairn at rnairn@natura.ie.



Members of the Irish Section Committee (from left) Richard Nairn, Pascal Sweeney, Mieke Muyliaert and Paul Scott.

North West England Section News

Section News

The North West England Section has enjoyed a series of highly successful and well supported events during the last quarter. These have included 'Habitat Management at a Flash!' at Wigan Flashes with Mark Champion from the Wildlife Trust for Lancashire, Greater Manchester and North Merseyside. This event considered various habitat projects and discussed their development. Discussions focused on reed bed improvements such as bed lowering, ditch construction and re-wetting considered the successes and failures of a variety of project actions. The visit also considered fish passage work, willow tit conservation, woodland improvement, heathland construction, and meadow management on a reclaimed site and woodlands.

The Section recently enjoyed a splendid event in Carlisle hosted by the Environment Agency. A full report on this is provided on the right by Dorian Latham.

The next event for the North West England Section is scheduled for 22 June – 'The conservation of grasslands and traditional management techniques in north west England'. The event is fully booked, but contact Jeremy James (jeremy@bowlandecology.co.uk) for details and to be placed on the reserve list.

Support for the Section continues to be strong as evidenced in the attendance at events. In planning events we have tried to ensure a good geographical coverage throughout our region. The North West England Section is compiling a list of events for the rest of 2007 and the start of 2008. We welcome your suggestions and offers – from all corners of our large region! Contact either Paul Rooney (Section Convenor) on rooney@hope.ac.uk or Liz Price (Section Secretary) on e.price@mmu.ac.uk if you would like to discuss a proposal.

*Paul Rooney CEnv MIEEM,
North West England Section
Convenor*

Report on the Carlisle City Flood Alleviation Scheme, Integrated Flood Risk Management

On Thursday, 26 April the Environment Agency hosted an IEEM North West England Section event at Carlisle United Football Club to discuss the progression of two large Capital Flood Alleviation Schemes (FAS) in Carlisle. The day reviewed some of the challenges facing the design team with emphasis on the environmental opportunities. The day was well attended by a mixture of ecologists and environmental managers from education, consultancy and statutory bodies.

Gary Jones-Wright, Technical Specialist Flood Risk Management and Dorian Latham, Team Leader Planning Liaison and Development Control represented the Environment Agency. Gary Jones-Wright introduced the flood risk challenges facing Cumbria and described the impact of the January 2005 floods. Carlisle and parts of Cumbria were subjected to extensive flooding in January 2005. Over 2,000 residential properties suffered extensive damage in the city with the cost of the flooding estimated to be over £400 million. The Warwick Road area of Carlisle lies close to the Rivers Eden and Petteril and was severely affected by flooding. The area is heavily urbanised with 1,300 properties at risk of flooding. The Eden and Petteril Flood Alleviation Scheme started construction in May 2006 to provide an improved Standard of Protection (SoP).

The Eden system is a highly sensitive environmental corridor with both SAC and SSSI designations. Previous development on the floodplain of both rivers constrained opportunities for 'setting-back' existing defences. However, the project design team wished to identify environmental enhancements integral to the scheme.

Melbourne Park was a neglected area of open space, detached from the river through the existing flood defence embankment. As part of the scheme the defences were set back and the park re-contoured and landscaped to provide damp meadow areas.

The area aims to provide an attractive area for the local residents. The Old Eden Diversion, which ran parallel to Warwick Road, flowed through an area of Victorian waste dumps and provided little ecological value. A new cut was excavated and the route of the old diversion was backfilled. The new watercourse provides a far superior habitat, and a good home for the solitary eel, moved before the old diversion was backfilled.

*Dorian
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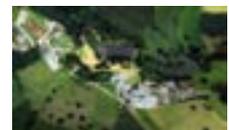
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With the steady growth of the Society and some significant new members, the time had come for SocEnv to pause and examine the way forward. SocEnv has just had an away day with that in mind. This was preceded by a dinner where the guest speaker was Sir John Harman, Chairman of the Environment Agency.

The day itself was attended by Eirene Williams and Jim Thompson from IEEM. The main point to consider was the extent to which SocEnv should be simply a Registration Authority with custodianship of the Chartered Environmentalist and how far beyond that it should attempt to go - if at all. The general view was that simply being a Registration Authority was not sufficient. This from the IEEM viewpoint was welcome confirmation of the founding principles of SocEnv. These were to act as an umbrella organization for Environmental Professionals, to be a significant voice for the environment and to act as a source of reasoned professional opinion on a wide range of environmental issues and to which the Government could reasonably look for advice.

The question now is how SocEnv can take things forward, given its limited resources both in finances and manpower. A start was made on a draft strategy plan which will be developed further at the next Board meeting. This will be held on 6 June and will also include the AGM. It will be followed by a reception in which the next Honorary Fellowship will be presented.

There is now a steady stream of applications for Chartered Environmentalist. Those who have successfully completed the process are: Dr Jonathon Benge, Mrs Ursula Digby, Mr Andrew Gardner, Miss Lindsey J. Husband, Ms Janet E. Nuttall, Ms Sharon L. Pilkington and Mr Hayden Torr - many congratulations.

In terms of the CEnv subscriptions for IEEM members, these have largely been paid but there was some confusion over payment by Direct Debit. This is now resolved and a separate Direct Debit process will operate at the time of IEEM membership renewal on 1 October. Please let the Secretariat know if you would like your SocEnv fees to be paid by Direct Debit. Please note that the SocEnv Board has approved a modest increase in membership subscriptions for 2008 (payable on 1 October 2007) from £25.00 to £30.00.

EFAEP Newsflash

Commission Reviews Recent Achievements, Current Priorities and Future Plans

The European Commission has adopted its mid-term review of the Sixth Community Environment Action Programme (6EAP), which looks at progress made since the 6EAP started in 2002 and the challenges ahead until it finishes in 2012. The review concludes that the EU is on track with adopting the policy measures outlined in the Programme. It makes clear that the Commission will continue to focus on addressing the 6EAP's four priority areas, namely combating climate change, halting biodiversity loss and protecting nature, reducing environmental impacts on health and reversing the unsustainable management of natural resources and waste.

Innovation Must Do More for the Environment

The European Commission has published a report on trends and developments in eco-innovation in the European Union. The report highlights that European companies are world leaders in several environmental markets and that current environmental legislation acts as a driver for promoting innovation in these markets. The report proposes to focus on a number of priorities and actions that will raise demand for environmental technologies and eco-innovation.

Environmental Liability Directive Ensures Polluters Pay

Important EU legislation laying down liability rules for damage to the environment came into force on 30 April. The groundbreaking new directive, the result of discussions that started in the late 1980s, is the first EU law specifically based on the 'polluter pays principle' set out in the EC treaty. It will ensure that, in the future, environmental damage in the EU is prevented or remedied, and that those who cause it are held responsible. Environmental damage includes damage to water resources, natural habitats, animals and plants as well as contamination of land, which causes significant harm to human health. Member States were required to transpose the directive into their national law by 30 April 2007, but to date only Italy, Latvia and Lithuania have done so. Consultation responses on the Directive in the UK can be found in the members' section of the IEEM website.

As reported in the last *In Practice*, the powerpoints for the recent IUCN-UK Committee meeting are now on the IUCN UK website - www.iucn-uk.org. This is useful material on a significant theme - valuing our biodiversity.

The focus of IUCN globally is now turning to the next Congress to be held in Barcelona in October 2008. The theme will be 'A Diverse and Sustainable World'. It will showcase the links between natural, social, cultural and economic diversity.

There are three sub-themes:

- a new climate for change;
- healthy environments, healthy people; and
- safeguarding the diversity of life.

The Congress will produce a range of concrete solutions - the Barcelona Legacy - for the world to become truly sustainable in the next two decades - nothing like aiming high!!

On the European front, one of the main interests is how to drive the Countdown 2010 initiative forward. IEEM signed up to this as has EFAEP and the Society for the Environment - the IEEM influence. IES, the Institution of Environmental Sciences, has also done the same. All this is to the good but if this movement is to be confined solely to those natural supporters, it will not make an impact - how to get the message across into the wider world is the real issue. So if IEEM members through their employers or contacts are able to bring more signatories into the fold it would be a very good thing. For instance there is no reason why a number of local authorities should not sign since they often play a significant part in the conservation of local biodiversity. 31 local and regional authorities have already done so including Hampshire County Council.

Clearly business has a major role to play and 'Business and Biodiversity' is one of the themes chosen for the Portuguese Presidency of the EU which is to start shortly. Companies with strong environmental performances can perform better on the stock market, manage their resources more efficiently, and provide better products and services. Several major companies are establishing environmentally sustainable policies - witness Marks and Spencer and Walmart. IEEM members may not yet feature in such illustrious boardrooms but they may be able to influence the behaviour of their own contacts.

For more information please contact info@countdown2010.net or visit www.countdown2010.net.

In the Journals

Sponsored by



Jim Thompson CEnv MIEEM and Jason Reeves AIEEM

This edition of *In the Journals* will focus on agri-environment and its related issues. There has been a spate of papers issued in the last few months on this topic and we felt that, as with the rest of *In Practice* which now has themed editions, it would be useful to focus in on this important and relevant subject.

M.J. Whittingham.

Will agri-environment schemes deliver substantial biodiversity gain, and if not why not?

Journal of Applied Ecology 2007, **44**:1–5.

One of the main aims of agri-environment schemes (AES) is to increase biodiversity on farmland. Common conservation practice is to identify areas containing valuable resources (e.g. habitats, ecosystems and species) and then to protect them: 'protected area' schemes. AES differ from typical protected area schemes because they are often applied to small patches of land, such as field boundaries, and are sometimes located in areas where target species does not occur.

AES require an enormous amount of funding and they have been applied across a large geographical area, i.e. the European Union. However, recent evidence suggests mixed results regarding the effects of AES on biodiversity.

It is hard to predict the consequences of AES on biodiversity because a number of factors are seldom accounted for explicitly. For example: (i) the occurrence of target species will vary between patches; (ii) there will be variation in habitat preference by species in different geographical areas; (iii) both optimal foraging theory and metapopulation theory predict that the distance from breeding individuals is likely to determine patch use; (iv) if resources are widely spread then the home ranges of some species may need to increase to encompass the multiple resources needed for breeding.

AES are likely to increase biodiversity if a lower number of larger resource patches are provided, in contrast to current practice that promotes many small fragmented areas of environmental resource. One way of achieving this may be to run these schemes more like traditional protected area schemes, with farms or groups of farms managed using extensive farming methods. Such an approach negates some of the problems of current AES and may help to address a wider range of concerns held by different countryside stakeholders.

Correspondence: m.j.whittingham@ncl.ac.uk

J.M. Bullock, R.F. Pywell and K.J. Walker.

Long-term enhancement of agricultural production by restoration of biodiversity.

Journal of Applied Ecology 2007, **44**: 6–12.

Experimental manipulations have shown positive impacts of increased species richness on ecosystem productivity, but there remain some questions about this relationship. First, most studies last < 4 years, which raises issues about whether diversity–productivity relationships are maintained in mature communities. Secondly, the conservation relevance of many studies is debatable. The authors addressed both issues using

long-term experimental studies of the hay yield of recreated species-rich grasslands.

Grasslands were recreated at two sites in southern England by using either species-poor or species-rich seed mixtures. The species-poor mixture comprised seven grasses as recommended for grassland creation in English agri-environment schemes. The species-rich mixture comprised 11 grasses and 28 forbs and was designed to recreate a typical southern English hay meadow.

After eight years the plots sown with species-rich mixtures resembled target diverse community types. The plots sown with species-poor mixtures had been colonized by a number of forbs but had lower numbers of grasses, legumes and other forbs than the species-rich plots.

In the eighth year the species-rich plots had an average 43% higher hay yield than the species-poor plots.

This study showed that the recreation of diverse grasslands of conservation value can have a positive impact on hay yield and which benefits the farm income.

Correspondence: jmbul@ceh.ac.uk

Y. Clough, A. Kruess and T. Tscharntke.

Local and landscape factors in differently managed arable fields affect the insect herbivore community of a non-crop plant species.

Journal of Applied Ecology 2007, **44**: 22–28.

The expansion of intensively managed annual crops plays a big part in driving the global biodiversity crisis. Field-scale diversification, for example leaving weeds to grow in crops, is one way in which diversity in agro-ecosystems can be restored. However, little is known about non-crop plant-based insect communities within arable fields.

The authors investigated how diversification of agro-ecosystems at the field and landscape levels affects the insect community of the creeping thistle *Cirsium arvense*.

Herbivore species richness was enhanced by both organic farming and landscape heterogeneity but not by higher densities of thistles in the landscape. For most of the species, host-plant plots in organic fields were more likely to be colonized than those in the conventional fields. The enhancement of diversity in organic fields is probably the result of a slightly higher natural cover of the host-plant *Cirsium arvense*.

Both diversification of landscape (fewer arable crops, more perennial habitats) and extensification through organic management are effective measures of enhancing arthropod diversity on weeds. The impact of field-scale agri-environment schemes on biodiversity should be supplemented by including landscape-scale diversification programmes to include a minimum level of perennial habitat cover. Biodiversity benefits of organic agriculture rely for a large part on non-crop plants. Weed populations should be allowed to coexist with the crop to maintain these benefits, which are threatened by more intensive 'organic' management, such as heavy mechanical weed control.

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C. Carvell, W.R. Meek, R.F. Pywell, D. Goulson and M. Nowakowski.

Comparing the efficacy of agri-environment schemes to enhance bumble bee abundance and diversity on arable field margins.

Journal of Applied Ecology 2007, **44**: 29–40.

Declines in abundance and diversity of bumble bees (*Bombus* spp.) in Europe have been linked to agricultural intensification and the resulting loss of suitable foraging and nesting habitats. Environmental Stewardship (ES) offers the opportunity to restore habitats of value for these important pollinators to agricultural land.

The authors compared the efficacy of different ES options for field margins on arable land in enhancing the abundance and diversity of flowering resources and foraging bumble bees over a three year period using a multisite experiment.

Overall, uncropped margins sown with mixtures containing nectar and pollen-producing plants were more effective in providing bumble bee forage than margins sown with a grass mix, allowed to regenerate naturally or managed as conservation headlands.

A mixture of agricultural legumes established quickly and attracted on average the highest total abundance and diversity of bumble bees, including the rare long-tongued species *Bombus ruderatus* and *Bombus muscorum*. However, marked differences were observed between species and sexes in their responses to field margin management over time.

A diverse mixture of native wildflowers attracted more of the shorter-tongued *Bombus* spp. and provided greater continuity of forage resources, especially early in the season. Allowing *Cirsium* spp. to flower on such margins also increased their attractiveness to male bumble bees.

Establishment of 'floristically enhanced margins' under Higher Level Stewardship will be important to provide diverse perennial communities of forage plants and to support a greater range of *Bombus* spp. and other pollinators.

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A. Holzschuh, I. Steffan-Dewenter, D. Kleijn and T. Tscharntke.

Diversity of flower-visiting bees in cereal fields: effects of farming system, landscape composition and regional context.

Journal of Applied Ecology 2007, **44**: 41–49.

Agri-environment schemes promote organic farming in an attempt to reduce the negative effects of agricultural intensification on farmland biodiversity and ecosystem services such as pollination. Farming system, landscape context and regional differences may all influence biodiversity, but their relative impact and possible interactions have been little explored.

The study was performed in three regions in Germany differing in land use intensity.

Higher bee diversity, flower cover and diversity of flowering plants were recorded in organic compared with conventional fields. Bee diversity was related both to flower cover and diversity of flowering plants.

Differences in bee diversity between organic and conventional fields increased with the proportion of arable crops in the surrounding landscape. Residual bee diversity increased with increasing landscape heterogeneity.

Bee diversity differed between the three regions, but the effects of farming systems and landscape context were independent of regional differences.

Agri-environment schemes that promote organic farming in homogeneous landscapes where there are few remaining flower-rich habitats could have the highest relative impact. However, while organic farming could help to sustain pollination services by generalist bees in agricultural landscapes, other measures are required to conserve more specialized bee species in semi-natural habitats.

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E. Öckinger and H.G. Smith.

Semi-natural grasslands as population sources for pollinating insects in agricultural landscapes.

Journal of Applied Ecology 2007, **44**: 50–59.

In intensively farmed agricultural landscapes, many species are confined to very small uncultivated areas such as field margins. However, it has been suggested that these small habitat elements cannot support viable populations of all species. Instead, species richness and abundance in these small habitat fragments may, at least partly, be dependent on dispersal from larger semi-natural grassland fragments.

The authors tested this hypothesis for butterflies and bumble bees in 12 independent landscapes in a region of intense agriculture in southern Sweden. In each landscape they surveyed abundance and species richness in one semi-natural grassland, one linear habitat (uncultivated field margin) adjacent to this (called proximate) and one similar linear habitat (called distant) situated at least 1,000 m from the semi-natural grassland patch.

Both species richness and density (individuals per unit area) of butterflies and bumble bees were significantly higher in proximate linear habitats than in distant ones. Moreover, butterfly species richness was higher for a given area in grasslands than in any of the linear habitat types. Butterfly density in grasslands did not differ from that in proximate linear habitats but was lower in distant linear habitats. The effect of isolation on density was stronger for less mobile butterfly species. For bumble bees there was no difference in species richness between grasslands and proximate linear habitats.

In order to sustain the abundance and diversity of insect pollinators in intensively farmed agricultural landscapes, the authors suggest that preservation of the remaining semi-natural grasslands or re-creation of flower-rich grasslands is essential.

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B.A. Woodcock, S.G. Potts, E. Pilgrim, A.J. Ramsay, T. Tscheulin, A. Parkinson, R.E.N. Smith, A.L. Gundry, V.K. Brown and J.R. Tallwin.

The potential of grass field margin management for enhancing beetle diversity in intensive livestock farms.

Journal of Applied Ecology 2007, **44**: 60–69.

The authors' aim was to develop field margin management practices that could reverse declines in intensively managed grassland biodiversity with particular respect to beetles.

In four intensively managed livestock farms in south-west England, 10 m wide field margins in existing grasslands were managed to create seven treatments of increasing sward architectural complexity. This was achieved through combinations of inorganic (NPK) fertilizer, cattle grazing, and

timing and height of cutting.

Beetle abundance, and species richness and evenness were influenced by margin management treatment and its interaction with year. Correlations with sward architecture and the percentage cover of dominant forbs and grasses were also found. Functional groups of the beetles showed different responses to the management treatments. In particular, higher proportional abundances of seed/flower-feeding guilds were found in treatments not receiving NPK fertilizer.

This study provides management options suitable for use within agri-environment schemes intended to improve faunal diversity associated with intensively managed lowland grasslands. Field margins receiving either no management or a single July silage cut were shown to support greater abundances and species richness of beetles, although subtler modifications of conventional management may also be beneficial, for example the absence of NPK fertilizer while maintaining grazing and silage cutting systems.

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J. Verhulst, D. Kleijn and F. Berendse.

Direct and indirect effects of the most widely implemented Dutch agri-environment schemes on breeding waders.

Journal of Applied Ecology 2007, **44**: 70–80.

In the Netherlands, agri-environment schemes are an important tool for halting the ongoing decline of meadow birds and, in particular, waders breeding on wet meadows. The effectiveness of the main scheme, postponed mowing, is heavily debated because it does not result in higher breeding densities. A recent introduction has been per-clutch payment: farmers are paid per wader clutch without being restricted in their farming practices.

The authors evaluated the effectiveness of the combination of the two measures, postponed mowing and per-clutch payment, by determining the number of birds and territories on 12.5 ha plots where both measures were being implemented. Conventionally managed grasslands served as controls. Additionally, on a field with postponed mowing and a paired control field, they measured a number of environmental factors that might influence wader distribution.

On plots operating a combination of postponed mowing and per-clutch payment, more territories of all bird species were found and more redshanks *Tringa totanus* were observed. The same pattern occurred on fields with per-clutch payment alone. On fields with postponed mowing alone, they found more territories of the most abundant wader species but on conventional fields there were more lapwings *Vanellus vanellus*.

The results show that conservation measures consisting of postponed mowing and per-clutch payment implemented by agri-environment collectives do not support a higher abundance of waders but do support marginally higher breeding densities of waders compared to conventional farms. These results are probably due to differences in soil moisture and groundwater depth. The effectiveness of agri-environment schemes directed towards conservation of waders might be enhanced by including raised groundwater levels into scheme prescriptions.

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R.F. Pywell, J.M. Bullock, J.B. Tallowin, K.J. Walker, E.A. Warman, and G. Masters.

Enhancing diversity of species-poor grasslands: an experimental assessment of multiple constraints.

Journal of Applied Ecology 2007, **44**: 81–94.

The authors investigated biotic and abiotic constraints on grassland diversification by manipulating seed and microsite availability, soil fertility, resource competition, herbivory and deficiencies in the soil microbial community.

The effectiveness of 13 restoration treatments was investigated over four years established in two productive grasslands in central-east and south-west England.

Severe disturbance involving turf removal followed by seed addition was the most effective and reliable means of increasing grassland diversity. Disturbance by multiple harrowing was moderately effective but was enhanced by molluscicide application to reduce seedling herbivory and by sowing *Rhinanthus* to reduce competition from grasses.

Low-level disturbance by grazing or slot-seeding was ineffective in increasing diversity. Nitrogen and potassium fertilizer addition accelerated off-take of phosphorus in cut herbage but did not cause a reduction in soil phosphorus or increase botanical diversity. Different grazing management regimes had little impact on diversity.

Three alternative approaches to grassland diversification, with different outcomes, are recommended. (i) High intervention deturfing, which would create patches with low competitive conditions for rapid and reliable establishment of the target community. (ii) Moderate intervention (harrowing or slot-seeding) over large areas, which would establish a limited number of desirable, generalist species that perform well in restoration. (iii) Phased restoration, which would complement the above approaches. Productivity and competition are reduced over three to five years using *Rhinanthus* or fertilizers to accelerate phosphorus off-take. After this time harrowing and seeding should allow a wide range of more specialist species to establish.

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R. Eschen, S.R. Mortimer, C.S. Lawson, A.R. Edwards, A.J. Brook, J.M. Iguar, K. Hedlund and U. Schaffner.

Carbon alters vegetation composition on ex-arable fields.

Journal of Applied Ecology 2007, **44**: 95–104.

Ex-arable soils are often characterized by high inorganic nitrogen (N) levels, which lead to the rapid establishment of annual and fast-growing perennial species during the initial phase of habitat creation. The addition of carbon (C) to the soil has been suggested as a countermeasure to reduce plant-available N and alter competitive interactions among plant species.

To test the effect of C addition on habitat creation on ex-arable land, an experiment was set up on two recently abandoned fields in Switzerland and on two six-year-old restoration sites in the UK. Carbon was added as a mixture of either sugar and sawdust or wood chips and sawdust during a period of two years. The effects of C addition on soil parameters and vegetation composition were assessed during the period of C additions and one year thereafter.

Soil nitrate concentrations were reduced at all sites within weeks of the first C addition, and remained low until cessation of the C additions. The overall effect of C addition on vegetation was a reduction in above-ground biomass and cover. At the Swiss sites, the addition of sugar and sawdust led to a relative increase in legume and forb cover and to a decrease in grass cover. The soil N availability, composition of soil micro-organisms and vegetation characteristics continued to be affected after cessation of C additions.

The results suggest that C addition in grassland restoration is a

useful management method to reduce N availability on ex-arable land. Carbon addition alters the vegetation composition by creating gaps in the vegetation that facilitates the establishment of late-seral plant species, and is most effective when started immediately after the abandonment of arable fields and applied over several years.

Comment: This paper recalls the debate in farming circles before stubble burning was banned and where enhanced carbon through stubble retention was claimed to reduce yields the following season.

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T.J. Webb, D. Noble, R.P. Freckleton.

Abundance-occupancy dynamics in a human dominated environment: linking interspecific and intraspecific trends in British farmland and woodland birds.

Journal of Animal Ecology 2007, **76**: 123–134.

Range size, population size and body size, the key macroecological variables, vary temporally both within and across species in response to anthropogenic and natural environmental change. However, resulting temporal trends in the relationships between these variables (*i.e.* macroecological patterns) have received little attention.

The authors used data on the distribution and abundance of 73 farmland and 55 woodland bird species in Britain over a 32-year period encompassing substantial habitat modification to assess the likelihood of these scenarios.

In both farmland and woodland habitats, the interspecific abundance–occupancy relationship changed markedly over the period 1968–99, with a significant decline in the strength of the relationship.

This is due to a decoupling of abundance and occupancy particularly in rare and declining species. Insights into the intraspecific processes responsible for the interspecific trend were obtained by analysis of temporal trends in the distribution of individuals between sites, which show patterns consistent with habitat quality declines.

Linking intra- and interspecific processes is helpful in assessing human impacts. In the case of British farmland and woodland birds, changes to the environment lead to species-specific responses in large-scale distributions. These species-specific changes are the driver of the observed changes in the form and strength of the interspecific relationship.

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G.K. Frampton, J. Lou and C. M. Dorne.

The effects on terrestrial invertebrates of reducing pesticide inputs in arable crop edges: a meta-analysis.

Journal of Applied Ecology 2007, **44**: 362–373.

There is an increasing awareness of the need to evaluate critically the effectiveness of environmental conservation measures, and to ensure that agri-environment policies are based on the best available scientific evidence.

This review investigated the impact of pesticide restriction in arable crop edges on naturally occurring terrestrial invertebrates using 23 relevant experimental studies.

The majority of the data concerned the exclusion or selective use of herbicides. No reliable information was available on the ecological consequences for naturally occurring arthropods

of excluding fungicides or insecticides separately from crop edges.

Studies focused on Carabidae, Heteroptera, Staphylinidae, Lepidoptera and grouped chick-food insects. Abundance of Heteroptera was up to 12.9 times higher where pesticide use was restricted. For other invertebrates, restricted use of pesticides generally either increased abundance or had no impact. Only two species exhibited a significant decrease in abundance.

Restricting pesticide use in crop edges in most cases did not significantly affect Carabidae.

Meta-analysis confirms that restriction of pesticide inputs in crop edges benefits arthropod populations at the edges of arable fields. This review deals mostly with herbicides and highlights a lack of information on the ecological consequences of excluding insecticides and fungicides from crop edges.

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B. Gove, S.A. Power, G.P. Buckley and J. Ghazoul.

Effects of herbicide spray drift and fertilizer overspread on selected species of woodland ground flora: comparison between short-term and long-term impact assessments and field surveys.

Journal of Applied Ecology 2007, **44**: 374–384.

Although application of fertilizers and pesticides to farmland is known to impact non-target organisms in adjacent semi-natural habitats, little is known of the impact on woodland understorey communities, which have considerable conservation significance in the arable landscapes of the UK and elsewhere in Europe. This study investigated the impacts of agrichemicals on several plant species typically found in ancient semi-natural communities.

Six species of woodland plants were exposed to the herbicide glyphosate at concentrations equivalent to those measured in spray drift trials (1–25% of the full application rate) in short-term greenhouse and long-term field experiments. Fertilizer was applied to half of the plants at a concentration likely to be seen in overspread situations (70 kg ha⁻¹ year⁻¹). The distribution of the same species was surveyed in woodland margins adjacent to fields with high, medium and low agrichemical inputs.

In both greenhouse and field experiments, herbicide treatments at drift concentrations caused increased mortality, reduced biomass and reduced fecundity in all species, although to differing degrees. The threshold of sensitivity to glyphosate was as low as 1% of the median field application rate for the most sensitive species.

In field surveys, the abundance of the most sensitive species was highest in woodland margins adjacent to fields with low agrichemical inputs and lowest beside high-input farmland. These differences were seen at least 4 m into woodland margins but were not found at 10 m.

There was considerable agreement between the short-term greenhouse and long-term field experiments. Adverse impacts of pesticide drift have been demonstrated to affect a variety of plants of woodland margins bordering farmland. Differences in the distribution of species most sensitive to herbicide extend to at least 4 m into woodland margins. The authors recommend the adoption of no-spray buffer zones of at least 5 m to protect the majority of woodland species from the impacts of agrichemicals applied to adjacent land.

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S. Klimek, A. Richter, M. Hofmann and J. Isselstein.
Plant species richness and composition in managed grasslands: The relative importance of field management and environmental factors.
Biological Conservation 2007, **134**: 559-570.

Decline of grassland diversity throughout Europe within the last decades is threatening biological diversity and is a major conservation problem. There is an urgent need to determine the underlying factors that control vascular plant species richness and composition in managed grasslands. In this study, 117 grasslands were sampled. local field management, site-specific environmental conditions and large-scale spatial trends were recorded for each site. the authors determined the pure and shared effects of these three sets of explanatory variables on the plant species richness and composition in grasslands. Most of the explained variation in plant species richness was related to the joint effect of local field management and environmental variables. However, the applied variation partitioning approach revealed that the pure effect of spatial variables contributed relatively little to explaining variation in both the plant species richness and species composition. The largest fractions of explained variation in plant species composition were accounted for by the pure effects of environmental and local field management variables. Moreover, the results revealed that the main mechanisms by which these sets of explanatory variables affect plant species vary according to the type of management regime under study. The authors conclude that a reduction of nitrogen fertilisation on meadows and grazing at a low stocking rate on pastures can help to conserve biodiversity.

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A. Wilson, J. Vickery and C. Pendlebury.
Agri-environment schemes as a tool for reversing declining populations of grassland waders: Mixed benefits from Environmentally Sensitive Areas in England.
Biological Conservation 2007, **136**: 128-135.

Agri-environment schemes (AES) are a key tool in attempts to reverse long-term declines in farmland biodiversity within the European Union. In southern England, repeat censuses of lowland breeding waders provide a rare opportunity to evaluate effectiveness of the Environmentally Sensitive Areas scheme (ESA), an AES designed with broad environmental objectives, including the maintenance or enhancement of the populations of these birds. The censuses provide a quasi-experimental approach, allowing a comparison to be made of breeding population trends of three species, Lapwing, Redshank and Snipe, on scheme and non-scheme land. The results show that all three species benefited in the more expensive ESA options aimed at enhancing habitat, but that only Redshank benefited from the less expensive, habitat maintenance options. The results also show the increasing importance of nature reserves for these species in southern England. The authors suggest that although AES can result in significant benefits, especially when monetary investment is high, delivery of biodiversity targets are by no means guaranteed.

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The Biology of Peatlands

Author: Hakan Rydin and John K. Jøglum

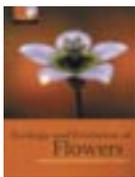
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The Biology of Peatlands provides a comprehensive overview of peatland ecosystems. Coverage is international although there is a focus on boreal and north temperate peatlands. As well as thoroughly referencing the latest research, the authors expose a rich older literature where an immense repository of natural history has accumulated. This accessible text is suitable for students and researchers of peatlands as well as the professional ecologists and conservation biologists requiring a concise, authoritative and up-to-date overview of the topic.



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Editors: Lawrence D. Harder and Spencer C. H. Barrett

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Instead of looking at individual case studies this book seeks to identify general principles concerning the role of ecological function in the evolution of reproductive diversity, which it sees as a more strategic approach. The book uses this approach to expose new insights into the functional basis of floral diversity, and presents the latest theoretical and empirical research on floral evolution. Floral biology is a dynamic and growing area and this book, written by leading researchers in this field, reviews current progress in understanding the evolution and function of flowers. Chapters contain both new research findings and synthesis and major sections in turn examine functional aspects of floral traits and sexual systems, the ecological influences on reproductive adaptation, and the role of floral biology in angiosperm diversification.



Heather and its Management

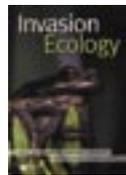
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This is the 7th title in the Golf Management Series written by IEEM members Bob Taylor and Lee Penrose and concentrates on the uses of heather in golf and its ecological and biological characteristics. Heather is an important feature of golf courses and due to its recent decline it is also of great interest to ecologists and environmental managers. This book aims to aid this understanding with the use of case studies and colour images throughout the publication.



Invasion Ecology

Authors: Julie L. Lockwood, Martha F. Hoopes and Michael P. Marchetti

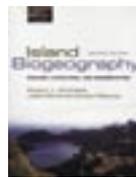
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This book provides a comprehensive introduction to all aspects of biological invasion by non-native species and highlights important research findings associated with each stage of invasion. It gives an overview of the invasion process from transportation patterns and causes of establishment success to ecological impacts, invader management, and post-invasion evolution. Increasing awareness of the problems associated with invasion has led to a rapid growth in research into the dynamics of non-native species and their adverse effects on native biota and human economies. This book provides a synthesis of this fast growing field of research, and is suitable reading for students and professionals in ecology and conservation management.



Island Biogeography

Authors: Robert J. Whittaker and José María Fernández-Palacios

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This second edition of Island Biogeography documents the recent advances in this field and explains how islands have been used as natural laboratories in developing and testing ecological and evolutionary theories. In addition, the book describes the main processes of island formation, development and eventual demise, and explains the relevance of island environmental history to island biogeography. The authors demonstrate the huge significance of islands as hotspots of biodiversity, and as places from which disproportionate numbers of species have been extinguished by human action in historical time. Many island species are today threatened with extinction, and this work examines both the chief threats to their persistence and some of the mitigation measures that can be used with conservation strategies tailored to islands.



The Barbary Macaque: Biology, Management and Conservation

Editors: J.K. Hodges and J. Cortes CEnv MIEEM
ISBN-10: 1-904761-31-3
ISBN-13: 978-1-904761-31-0
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Price: £55.00

The Barbary macaque is closest to the ancestral form of one of the most successful and diverse groups of primates alive today - the macaques. It is also the only remaining African representative of this genus (all other species being Asian), and faces a somewhat uncertain future. Its present distribution in the wild is restricted to a few isolated sub-populations in Algeria and Morocco. This book sets out to present a synthesis of current knowledge of the biology of the Barbary macaque with the combined aims of i) emphasising aspects of comparative and evolutionary significance and ii) addressing issues relevant to the management and conservation of the species both in captivity and in the wild.



Otters: Ecology, Behaviour and Conservation

Author: Hans Kruuk
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Otters are highly charismatic and popular animals and are of considerable concern to conservationists worldwide. This book has a very broad scope and covers 13 otter species from five continents. It emphasises recent research and conservation management initiatives for all 13 species, incorporates recent molecular research on taxonomy and population genetics, and discusses the wider implications of otter studies for ecology and conservation biology. The style of this book will make it appealing to both amateurs and professionals.



Conservation Education and Outreach Techniques

Authors: Susan K. Jacobson, Mallory D. McDuff
and Martha C. Monroe
ISBN-10: 0-19-856771-5
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This book is claimed to be the first practical guide to conservation education, concentrating largely on techniques. The conservation of biological diversity depends on people's knowledge and actions. This book presents the theory and practice for creating effective education and outreach programmes for conservation. The authors describe an exciting array of techniques for enhancing school resources, marketing environmental messages, using mass media, developing partnerships for conservation, and designing on-site programmes for natural areas and community centres. Case studies from around the world illustrate techniques and describe planning, implementation, and evaluation procedures, enabling readers to implement their own new ideas effectively.



Introducing Environment

Authors: Alice Peasgood and Mark Goodwin
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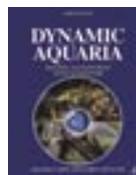
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The Biology of Freshwater Wetlands

Author: Arnold G. van der Valk
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Wetlands occur around the world and exhibit significant differences in both hydrology and species composition. However, rather than concentrating on the detailed characteristics of specific wetland types, this concise textbook emphasizes their universal environmental and biological features. A combination of hydrology, low oxygen levels, and dense plant canopies are the major defining features of wetland habitats. The adaptations of wetland micro-organisms, invertebrates, plants, and vertebrates to anaerobic conditions are a major theme of this book. The book demonstrates how shifting environmental gradients are responsible for the distribution of algae, invertebrates, and vertebrates in wetlands. The future of wetlands is also examined, including the potential impacts of global climate change and efforts to restore wetlands.



Dynamic Aquaria

Authors: Walter Adey and Karen Loveland
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In the third edition of this book the authors demonstrate how the living systems modelling of aquatic ecosystems for ecological, biological and physiological research, and ecosystem restoration can produce answers to very complex ecological questions. The book also offers an understanding of living ecosystem modelling and discusses how this knowledge has produced methods of efficiently solving many environmental problems. Public education through this methodology is the additional key to the broader ecosystem understanding necessary for the continuation of the human species. Living systems modelling as a wide spectrum educational tool can provide a primary vehicle for that essential step. This edition also covers the many technological and biological developments in the eight plus years since the second edition.

News in Brief

Science holds the key to a greener future

Sir David King has recently stated that the environmental problems facing the world in the 21st Century are the legacy of human activities, but that we also 'hold the key to solving these problems by attracting the brightest young minds into the world of science. Mankind has never had a greater need for science, and for the spark of human ingenuity to apply this to tackling today's great global challenges. Built on centuries of tradition and endeavour, the UK is second to none in the diversity and excellence of its scientific heritage. Our nation punches well above its weight in the quality and number of academic papers and citations, above Germany, France and Japan, and trailing only the far bigger economy of the US. It is vital therefore that we pay equal regard to ensuring that the UK's outstanding scientific outputs flow through to enhance the quality of life and prosperity for people in the UK, and beyond.'

Millennium Seed Bank gets billionth deposit

The billionth seed has been banked at the largest plant collection of its kind in the world at the Millennium Seed Bank of the Royal Botanic Gardens, Kew. The bank already holds the seeds of more than 18,000 wild species from 126 countries - including 88 per cent of the UK's flora - and by 2010 it should hold the seeds of 30,000, or 10 per cent of the world's flowering plants. The target for 2020 is 75,000 species, or a quarter of the total. The billionth seed comes from the African bamboo, *Oxytenanthera abyssinica*, and was taken from Mali, in west Africa. This bamboo is the most hardy of the three African bamboo species and has valuable characteristics: it lives on poor soils, is fast-growing, drought-resistant, and survives fire in its natural habitat. Within Mali and other sub-Saharan African counties, it is used for house construction, furniture, basket weaving and wine making.

Petition for LBRC funding

There is currently a petition running on the No.10 Downing Street Website which asks the Government to consider setting a requirement for Local Authorities to provide funding for a Local Biodiversity Record Centre in their area. The petition has done moderately well with over 1,500 signatures, so far, but it does need more if it is to be noticed by government officials and to truly represent the feelings and interests of naturalists, ecologists and all others

involved with LRCs. If you are interested in signing the petition it can be found at petitions.pm.gov.uk/LRC-Funding. If you cannot sign up from work then you could consider signing up from home.

RSPB Minsmere celebrates 60 years of conservation

The RSPB's flagship nature reserve, Minsmere on the Suffolk coast, is celebrating 60 years of saving some of the country's most endangered birds from extinction. The site is a haven for a stunning array of plants and animals and was first leased to the RSPB in April 1947, the same year that avocets (extinct in the UK for 100 years) were found breeding there. This year is also the 60th anniversary of their return. Ever since, Minsmere has provided a lifeline to birds on the brink of disappearing from the UK. Avocets, bitterns, marsh harriers and bearded tits all owe their current success to the reserve and to the work of its staff and volunteers. The conservation work continues to this day with efforts to bring stone-curlews back to Minsmere already bearing fruit on farmland, which has been recently restored to heath and grassland. Among Minsmere's other riches are nightingales, nightjars, otters, water voles, antlions, the largest herd of red deer outside Scotland and more than 1,000 different species of moths and butterflies, including one named after the reserve - the Minsmere Crimson Underwing.

Alien threat to native flowers

Gardeners in Cornwall have been asked to help protect the county's native flora from invasive alien plants. Cornwall Wildlife Trust says that plants like Japanese knotweed and montbretia often spread to the wild from bags of garden rubbish. Montbretia has become particularly common on Cornwall's roadsides and is pushing out native flowers. The Trust has reminded people about disposing of garden waste responsibly to prevent the spread of these species. It said people should not throw garden rubbish over hedges or by the roadside as this can introduce alien plants like the montbretia into the wild.

River currents and rising seas threaten iconic birds

The changing currents of a tidal river are threatening to swamp an RSPB reserve and its important population of birds. Read's Island in the Humber estuary is being eaten away by the river and rising sea levels could now accelerate the process. As a result, the reserve looks set to disappear in the near future. The

reserve is a home for avocets (the bird on the RSPB's logo and an icon of bird conservation) which breed on its rare saline lagoons. About 100 pairs breed on the island out of a UK population of around 1,000 breeding pairs. The fragility of wildlife habitats on the Humber has been further highlighted by the news that the RSPB's other reserve on the Estuary, Blacktoft Sands, has also been flooded.

Otter numbers on the increase

A study has shown that Scotland's otter population is recovering well after falling sharply over the last 40 years. The devastation of river fish stocks by chemicals and pollution in the 1960s and 1970s saw the animals vanish from many parts of the country but a survey by Scottish Natural Heritage found otters were being spotted in parts of the country where they had been absent for years. However, otters remain relatively rare and are strictly protected by European law. The two-year research project shows there are now around 8,000 otters spread across virtually every part of Scotland, including watercourses in Aberdeen and the River Clyde.

Park's carbon footprint examined

The carbon footprint of the Cairngorms National Park is being measured in an effort to determine what contribution it makes to global warming. Park authority staff and researchers from the Macaulay Institute are investigating what volume of harmful gases are generated within the area. The results of the studies are expected to be available by June 2007.

£4.5m grant set to restore park

Clissold Park, in Hackney, is to be restored to its original 19th Century design with a £4.5m grant that will see its Grade II listed Clissold House restored, and improvements will be made to the landscape, paths, and gates. Work to conserve and enhance the biodiversity of the park will also be undertaken while other buildings in Clissold Park will also be refurbished and restored.

£67m Eden project will show the perils of a warmer world

Plans for Britain's first tourist attraction dedicated to climate change and how humans will live with increasing temperatures have been unveiled at the Eden Project in Cornwall. The founders of Eden's 'biomes' want to build a new £67m building, called The Edge, to allow people to explore what life will be like when weather patterns push humans to invent new ways of living.

Study looks at island amphibians

A study of non-native amphibians is taking place on the Isle of Man. A number of toads and newts have been introduced to the island but there is little information about them. The study is investigating the rise in such species. Three newt species, the great crested newt, the palmate newt and the smooth newt, have all been spotted on the island in recent years. Anyone who knows of any sites on the island which boasts toads or newts is asked to get in touch with the Department of Agriculture, Forestry and Fisheries (DAFF). However, under the Wildlife Act 1990, it is illegal to move or disturb these creatures without a licence, so people are urged not to capture them.

Mountain pony extinction threat

A report by the Countryside Council for Wales (CCW) says that Welsh mountain ponies could face extinction unless more is done to help protect them. Limited grazing lands and a loss of certain breeds are the main problems facing the ponies, which have roamed Wales for more than 3,000 years. The report said some ponies are also key to maintaining landscapes through grazing. The CCW owns 200 ponies and has a breeding programme in place. The report goes on to say that the extinction of the ponies would also have consequences for biodiversity and the continuing existence of traditional breeding practices, and that their importance as conservation grazers, helping to maintain wild lands, is not fully recognised by land managers.

As ocean levels swell, an English coast crumbles

Coastal erosion has been a fact of life in East Anglia for a century, because the land under it is slowly sinking. But the erosion has never been as quick and destructive as it has been in recent years, an effect of climate change and global warming, according to many scientists. To make matters worse for coastal farmers, but not necessarily for conservationists, the British government has stopped maintaining large parts of the network of seawalls that once protected the area. Under the policy of 'managed retreat', governments around the globe are concluding that it is not worth fighting every inevitable effect of climate change. With higher sea levels and more vicious storms created by warming, the coastal fields along some parts of the east of England are rapidly disappearing as the low cliffs on which fields sit slip into the water in huge chunks.

Chainsaw massacre

They make our streets more beautiful, improve our health and reduce global warming. Yet more and more trees

are being chopped down in our towns and cities. In urban areas across the country millions of street trees are battered by supersized lorries, utility companies dig up their roots, high-density developments squeeze them out, mobile-phone companies and CCTV operators demand they are trimmed back, water-main repairs shut off life-giving leaks, insurers claim they are causing building subsidence. An inquiry by the Greater London Authority will soon report on what it calls the 'chainsaw massacre' of the capital's seven million trees. The grand, green legacy of far-sighted Georgian and Victorian planners is being destroyed. Evidence submitted to the GLA is thought to be typical across many urban areas.

Restoration plan for Espie's wild habitat

One of Ulster's rarest habitats will be recreated at Castle Espie as part of a major £4m restoration project. The huge engineering project at the Wildfowl and Wetland Trust centre will attract more wildlife and uncover more of the site's rich history. The work will involve pushing a small hill into Strangford Lough, allowing the lough to flow in and restore the salt marsh, while using some of the spoil to create freshwater habitat. At the same time, the visitor centre is to undergo a major change to become a landmark example of a sustainable building.

Acidic Oceans are threatening sea life

A major UN report on climate change impacts says that rising carbon dioxide emissions are making the world's oceans more acidic, particularly closer to the poles, heralding disaster for marine life. A high take-up of carbon dioxide by polar oceans was producing marked changes in several species. Changes could affect the chemistry of dissolved nutrients, potentially causing large-scale changes in marine ecosystems with a knock-on effect to other larger species, such as fish and squid that rely on these organisms to survive. Other recent reports say corals and molluscs are also being affected by increasingly acidic oceans, disrupting the processing of calcium carbonate for their skeletons and shells.

Urban Habitats IV: Green Roofs and Biodiversity

Volume IV of Urban Habitats has recently been published and is an open-access journal focusing on the biology of urban areas. The volume includes a special section on biodiversity and green roofs with six pioneering papers from Switzerland, Germany, England, and Canada focussing on the biological value

of extensive green roofs. The research adds to a small but expanding body of evidence suggesting that green roofs can provide living space for plants and animals, in particular mobile species such as certain invertebrates and birds. Urban Habitats is freely available at www.urbanhabitats.org.

Air travel threatens biodiversity

Research at Oxford University has examined how global air travel has made it easier for pests to move from one part of the planet to another. For centuries the distances that potential pests and diseases had to cover was a natural barrier, but in the age of low cost air travel the chances of bringing in new species by accident are so much higher. The research has identified an 'invasion window' across the global air network from June to August when climatic conditions at regions linked by long haul routes are most similar to one another and with a higher number of flights. While the spread of invading species in a new area has been extensively studied, relatively little work has been done on how such organisms might initially be dispersed and survive.

The Ecosystems Approach Project

DEFRA are currently working with stakeholders to develop an action plan for embedding an ecosystems approach to conserving, managing and enhancing the natural environment across policy-making and delivery in England. An ecosystems approach provides a framework for looking at whole ecosystems in decision making, to ensure that we can maintain a healthy and resilient natural environment now and for future generations. In order to implement an ecosystems approach, it will be necessary to embed the concepts of working within environmental limits and valuing ecosystem services in policy and delivery, to help move towards the goal of sustainable development. The DEFRA background paper for the seminar on 26 April 2007 entitled Valuation of Ecosystem Services in a Decision Making Context can be found at www.DEFRA.gov.uk/wildlife-countryside/natres/index.htm.

Redefining Europe's borders, bringing the Sea to the Forefront

This was the title of a presentation given at the Seminar of the European People's Party Group of the Committee of the Regions: 'A regional perspective for the future European maritime policy' in Madeira on 11 May 2007. The full text can be found at <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/07/304&format=HTML&aged=0&language=EN&guiLanguage=en>

Anoraks and Tauro-Scatology

During a lecture at University College, London in February, Barbara Young, Chief Executive of the Environment Agency, referred to the technical staff within her Agency as 'anoraks'. Knowing that Basil O'Saurus, the IEEM's very own Professor of Tauro-Scatology takes a keen interest in sartorial matters, we thought that he might like to comment on her use of imagery. What do you think, Prof?

Well, I can tell you that not all of the Environment Agency's technical staff were flattered.

Why was that?

I would have thought that it was obvious. An anorak conjures up images of a slightly overweight man with poorly developed social skills, too much facial hair, body odour problems and two or more pens sticking out of his breast pocket.

A geek, in other words?

Exactly. And, anyway, if we had to define the modern ecologist by an item of clothing, it would be a cagoule, not an anorak. This is a much better metaphor for the lifestyle we lead – rough, tough, go anywhere, do anything...

... lots of pockets, a hood, breathable fabrics ...

I think that you're taking my analogy rather too literally.

Okay. How about 'in touch with nature?'

That's more like it. But let's be fair: the cagoules (as we must now refer to them) are not averse to derogatory, clothing-related metaphors of their own are they? Use of the term 'suit' does not usually imply a healthy respect for good tailoring or for the benefits of going on expensive management courses, does it?

You're absolutely right. It usually implies that the recipient of the insult is too far removed from the coalface to have a great deal of understanding of the complexity of the problems they profess to manage.

Whereas, to turn the metaphors around, the suit's view of a typical 'cagoule' would normally be of someone who is too involved in the complicated details of the real-world to take a strategic view of a problem.

Someone whose preferred solution is scientifically realistic but too expensive and takes too long, in other words?

The modern public-sector definition of 'strategic' is, let's face it, knowing which corners can be cut without anyone noticing.

And do you have any solutions to this cultural divide that splits our profession?

Do you remember the 1990s idea of 'dress down Fridays'?

Vaguely. It was the bizarre idea that people worked better if they were allowed to wear casual clothes to work on a Friday. How does that apply to environmental management?

Us 'cagoules' relish our scruffy appearance, little realising how this contributes to the low esteem with which the 'suits' regard us. So, I have come up with the idea of 'dress-up Fridays'. Men turn up at work on Fridays wearing a suit and tie and women wear skirts and killer heels.

How will that help?

Probably not as much as the suits actually digging out their long-forgotten wellies and waterproofs and spending a bit more time in the field, but it does have one great psychological bonus.

What is that?

Stress relief. All the time we spend in front of the mirror practising tying our Windsor knots is time that we are not worrying about the imminent re-organisation.

Is a re-organisation imminent?

We're talking about the British public sector. Of course there is an imminent re-organisation.

One last question: is there any common ground between suits and cagoules?

There is cause for hope because both groups agree that the only etymologically-correct use of the term 'anorak' is to describe members of the IT support service.

What do the IT support staff say?

Let's just say that inappropriate use of the term in their vicinity can lead to servers going off-line for maintenance at critical times of the day.

Fair enough. Thanks again for your time, Prof.



J.A. Booth

MBA, MSc, MICFor, FARborA, MIEEM,
DipArb (RFS), LCGI (Hort), NDArb

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New and Prospective Members

APPLICANTS

If any existing Member has any good reason to object to someone being admitted to the Institute, especially if this relates to compliance with the Code of Professional Conduct, they must inform the Executive Director by telephone or letter before 9 July 2007. Any communications will be handled discreetly. The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from Council but may be taken directly by Council itself. IEEM is pleased to welcome applications for Membership from the following:

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The following have successfully upgraded their Membership:

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Mr Timothy P. Allen, Mr David J. Burton, Mr Pat Doherty, Mr Dave Bigden, Mr Murray Bracewell, Mr Jeremy Burgess, Mr Jonathan R. Cranfield, Mr David Ferguson, Dr Celia B. Figueira, Mr Simon J. Hirst, Mr Anton C. Kattan, Mr Simon Mason, Dr James D. Riley, Mr Paul Sinnadurai, Miss Jessy Simmance, Miss Eleanor Weir

What's on July – September 2007

8-12 July 2007.

IALE 2007 – Landscape Ecology: Scientific Principles in Practice.

Wageningen, The Netherlands.
The world congress of the International Association for Landscape Ecology.
www.iale2007.com

8-13 July 2007.

Symposium for European Freshwater Sciences.

Palermo, Italy.
www.sefs5.it/pagina1280.html

11-14 July 2007.

4th International Limnology Congress.

Barcelona, Spain.
www.ilic2007.com

12 July 2007.

Ecology and biogeography of the smaller Indian ocean islands.

London.
Evening meeting of the Linnean Society.
www.linnean.org

16 July 2007.

ENTO '07 - Royal Entomological Society Annual National Meeting and Symposium on Aquatic Insects.

University of Edinburgh, Scotland.
www.ento07.org.uk

23-27 July 2007.

Cultural Landscapes - Changing Landscapes.

Swansea University, Wales.
The International Association of Vegetation Science's 50th Annual Symposium. www.iavs.org/meet.htm

9-10 August 2007.

Countryside Management Association Annual Conference.

Stowe Mansion, Buckinghamshire.
www.countrysideassociation.org.uk/index.php

24-29 August 2007.

European Ornithologists Union Conference.

Vienna, Austria.
For further details visit: www.eou.at

31 August - 2 September 2007.

National Bat Conference.

University of York.
www.bats.org.uk

2-5 September 2007.

41st National Arboricultural Conference.

University of Warwick.
www.trees.org.uk/index.php

10-12 September 2007.

BES Annual Meeting.

University of Glasgow, Scotland.
www.britishecologicalsociety.org

13 September 2007.

Animals and their Ecosystems.

London.
Free Earthwatch Institute lecture.
www.earthwatch.org

15-16 September 2007.

Marine Conservation Society Beachwatch 2007.

All around the UK.
www.adoptabeach.org.uk

16-21 September 2007.

Living with Beavers and Large Carnivores.

Bavarian Forest National Park, Germany.
A trip to see beavers and other large mammals in their natural habitat – run by Derek Gow Consultancy - spaces still available. For further details, contact Derek Gow, Tel: 01409 211249 or email: derekJGow@aol.com

17-19 September 2007. The History, Ecology and Archaeology of Medieval Parks and Parklands.

Sheffield Hallam University.
A conference by the Biodiversity and Landscape History Research Institute.
www.ieem.net/News%20and%20Events.htm

17 - 21 September 2007.

Ecology and Management of Alien Plant Invasions.

Hyatt Regency Perth, Western Australia.
9th International Conference.
www.congresswest.com.au/emapi9

25-26 September 2007.

Biodiversity in the New Forest.

Balmer Lawn Hotel, Brockenhurst.
www.bournemouth.ac.uk/conservation/newsandevents/news_200307.html

26-30 September 2007.

Nature - Bridging Borders (Europarc2007).

Ceský Krumlov, Czech Republic.
www.europarc.org

27 September 2007.

Designing with Trees.

Kew Gardens, London.
www.trees.org.uk

27 September 2007.

People and Wildlife in National Parks.

Loch Lomond and Trossachs National Park, Scotland.
IEEM Scottish Section conference.
www.ieem.net/Scottish%20Events.htm

27 September 2007.

The ENDS Report Environmental Communications Conference.

The New Connaught Rooms, London.
www.ends.co.uk/events.htm

13-15 November 2007.

IEEM Autumn Conference – Making the connections – a role for Ecological Networks in UK nature conservation.

Nottingham.
www.ieem.net/Conferences.htm

IEEM workshops with places still available:

| | |
|--------------|-------------|
| 15-17 June | Sedges |
| 20 June | Woodlands |
| 10-11 July | Knotweed |
| 15 August | Dormice |
| 20 August | Water Voles |
| 21 August | Water Voles |
| 13 September | Blanket Bog |
| 26 September | Tree ID |

More information - www.ieem.net

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

Centre for Alternative Technology
Centre for Alternative Technology,
Machynlleth, Powys, SY20 9AZ
01654 705950
www.cat.org.uk

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

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

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