



# In Practice

Bulletin of the Institute of Ecology and Environmental Management

## Alien Invasive Species



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# Editorial

## An Alternative View

**J**apanese knotweed has rarely been considered to have any advantages and as ecologists we have put a great deal of effort into trying to put down this impressive non-native invasive species. Ecologists, nevertheless, have shown rare insight into the value of this urbanite creating surrogate canopy structure for bluebells and habitat for otter holts. Maybe it is time to see what else we can learn from Japanese knotweed and our experience since it was first let loose in 1886 in the surrogate for Japanese lava fields at Maesteg, South Wales? The first lesson is that it was not for another 80 years or so that Japanese knotweed became a problem and, as we know, this is not the only species to have a lag phase of decades. Should we not be putting more effort into identifying tomorrow's Japanese knotweed, a challenging research area? Should there be a prize for the first prediction that comes to pass? ...but strictly no cheating! A successful candidate (the plant that is) could then be the focus of an early response to eradicate it before it went out of control. This approach might lead to some undeserving winners (ecologists that is) but this would still be cheaper than our present approach... and we'd probably never know.

We have not been backward in spending large sums of money on trying to control Japanese knotweed, or rather responding to legislation in order to avoid prosecution and/or a bad press. Examples of attempts to co-ordinate such control are few and far between: the majority of the millions of pounds have been spent with no thought as to a concerted effort to deal with anything other than my backyard, development site, business park or indeed Olympics Park. So what are the lessons here? Nobody intended that business, industry, the transport network, river authorities, etc. should spend millions on controlling Japanese knotweed. It wasn't even envisaged that putting it on Schedule 9 of the Wildlife and Countryside Act would lead to its becoming a contaminant and hence falling under the Environmental Protection Act causing the application of even more thousands of gallons of herbicides and tonnes and tonnes of soil being carted off to landfill. If we can do all this without really trying, how much more could we achieve if we put our minds to it?

Well, to be fair, considerable effort has been put into dealing with Japanese knotweed, such as tried and tested survey and assessment methods, the application of GIS in planning and assessing management, fitting control measures to a thorough knowledge of species' autecology, and the development of novel techniques including, excitingly, the first release of a bio-control agent in earnest in Europe outside of a controlled environment. These lessons are eminently applicable to a long list of other invasive plants including tomorrow's Japanese knotweed. The end of term report, however, does identify areas for improvement: risk assessment (did we ever demonstrate that Japanese knotweed has a negative effect on biodiversity in the urban environment?), landscape scale, co-ordinated and/or integrated management (where are the case studies to provide best practice?), etc.

Although Defra's GB Strategy for Invasive Non-native Species makes little reference to Japanese knotweed (thank goodness), it does provide the direction in which invasive species management needs to be going: As ecologists, we should be familiar with the strategy and make sure that it informs the advice we give and the work we undertake. As for Japanese knotweed, isn't it time we showed it a little more respect, not least for the encouragement that it should give us that we could achieve a lot, lot more if we are prepared to learn from our experience and apply our science... and, in some cases, shouldn't we just leave it alone?

*Max Wade CEnv FIEEM*  
*Director of Ecology, RPS*

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Cover image: *Rhododendron* flowers

Photography: Sean Hathaway 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.

# The Age of Aliens

## – Human Perception and Management of Invasive Species

Paul Roebuck

Environmental Consultant, Environmental Perspectives LLP

**T**he story of invasive species in the UK and around the world is an engaging tale. 'Foreign' invaders are considered a threat to our biodiversity, economy and even human health.

Increasingly, we as humans are aware of the attributes of certain species to be 'alien' and the list of invasive plants and animals is ever growing. The Natural Environment Research Council (NERC) Centre for Ecology and Hydrology (CEH), in the past five years, co-ordinated the Delivering Alien Invasive Species Inventories for Europe (Daisie) project, which is the most comprehensive inventory of invasive species ever undertaken for Europe. The results showed the number of invasive species had been massively underestimated. NERC identified almost 11,000 alien species in Europe and the trend of new flora and fauna shows no signs of slowing down. Globalisation is a key reason for the burgeoning list and as our world grows ever smaller it is likely to mean the issue of alien invasive species will only intensify.

Whilst the list of invasive species is enormous and escalating there are key species that have significant impacts on our native ecology and economy. Laws have been developed (at both the international and national levels) to tackle these key problem species. The Wildlife and Countryside Act (1981 as amended)<sup>1</sup> (WCA) includes a list of these key species in the UK. The Act makes it an offence to release into the wild any animal, plant or micro-organisms not ordinarily resident to the UK or which constitutes a known threat or is listed on Schedule 9 of the Act.

It is now over a year since new invasive species additions were added to Schedule 9 of the WCA. The list was extended and became legally binding legislation on 6 April 2010. Now plants such as *Cotoneaster* sp. and Virginia creeper sp. and animals including Chinese mitten crab *Eriocheir sinensis* join Japanese knotweed *Fallopia japonica* amongst others on the infamous list.

Many of these new Schedule 9 species are already prevalent in the UK and could very probably be found in your back garden or within a local community landscape. They frequently could be found in a variety of different locations and all manner of 'development' sites. A good example of a new plant species on Schedule 9 with such characteristics is *Rhododendron ponticum*. Eight new species of *Rhododendron* were originally gathered from the eastern Himalayas and bought back to Kew Gardens in the 1800s. The gardening public received these new species gratifyingly as at the time they were perceived as highly suitable plants for shrub planting. *R. Ponticum* is now classed as invasive due to its vigorously growing nature in the wild that enables prolific growth across many a woodland understorey in the UK, particularly towards the west of the country. Below *Rhododendron*'s dense structure, plants find it difficult to establish and animals also suffer, therefore decreasing the overall nature conservation value of any given area. This 21st century perception of *Rhododendron* in the UK is very different than experienced in the 1800s.

The list of species on Schedule 9, including those recently introduced, apply to Section 14 of the WCA. The purpose

of Section 14 is to prevent the release into the wild of certain plants and animals, which may cause ecological, environmental or socio-economic harm. For an offence to be committed, a release or allowing escaping into the wild must occur. As an example, if a plant listed on Schedule 9 is not adequately controlled by the land owner, once they are aware that it is present, and the species is allowed to spread onto adjoining areas, then this would constitute 'causing to grow in the wild' and would therefore be regarded as an offence.

The implications for developers and land owners are clear; they need to be aware of these new Schedule 9 species and the ramifications of their presence on privately owned land otherwise they are breaking the law. As ecologists and environmental consultants we also need to be familiar with the species which have been added to the list. It is now our responsibility to highlight the presence of these species during a Phase 1 Habitat and Protected Species Survey or indeed any type of Biodiversity Survey. Further to identification on site, suitable mitigation and eradication measures can be recommended. Speaking from experience, whilst most land owners and developers we currently work with are environmentally inclined, this new legislation is still not bedded in their mindset. We therefore continue to provide guidance on the subject and advise appropriately where it is necessary. Over the last year, since April 2010 we commonly have found new Schedule 9 plant species during straightforward biodiversity surveys. In particular, *Cotoneaster* sp. has been recorded on a number of sites although usually this is in the context of a well managed landscape which may therefore not constitute as an offence.

It is not only private landowners and developers that need to be kept updated with the legislation and implications relating to invasive species. A recent article in *Conservation Land Management* states that: 'The ongoing threat to biodiversity from non-native species needs to be highlighted more, as too many people are complacent about the presence of certain non-native species and continue to buy invasive species from garden centres and are happy to allow them to grow on their land. More education and interpretation are required on the ground and more enforcement and tighter controls are needed.'<sup>2</sup> I would concur with this opinion and believe that the public also has a role to play in limiting the spread of 'aliens'. Just as in the 1800s, when we would not have considered *Rhododendron* as a problem species, are there non-native vigorous species today that we are planting that may ultimately be creating a similar long-term nuisance? Arguably, the most effective approach to solving the problems caused by non-native invasive plants is by preventing them from escaping into the wild in the first place.

But what of species that are not on the Schedule 9 list? If the best method of protection is prevention then is work being carried out to establish future problem invaders within the UK? The answer to this questions looks to be yes with regard to plants, where a new report by the charity Plantlife, outlines a system for identifying the problem garden plants of the future. Plantlife have devised a rapid risk assessment screening process for quickly assigning a broad level of invasive threat

to a non-native plant. They applied the process to almost 600 plants that are grown or sold in the UK or are already present but not yet widespread in the wild. The system is based on the Australian Weed Risk Assessment<sup>3</sup>. The process has been well received internationally, as a tool for identifying international threats, and provides a horizon scanning service which can be used to help prioritise resources by recommending a shortlist of plants for which more detailed assessment is considered imperative and/or prudent. Plantlife believe a number of plants are on the brink of becoming invasive in Britain, but they have been overlooked in recent legislative changes, in particular referring to the new Schedule 9 species in the WCA that aimed to provide better protection for the environment from invasive species. Within Plantlife's report *Here Today, Here Tomorrow - Horizon Scanning for Invasive Non Native Plants*<sup>4</sup> the charity highlights a number of 'ones to watch', which includes Evergreen oak *Quercus ilex*, False acacia *Robinia pseudoacacia*, Himalayan knotweed *Persicaria wallichii*, Large flowered waterweed *Egeria densa*, Pickerleweed *Pontederia cordata*, Pirri-pirri-bur *Acaena novae-zelandiae*, Tree of heaven *Ailanthus altissima* and Turkey oak *Quercus cerris*. Using Plantlife's Rapid Risk Assessment these species are classified as having a 'Critical' or 'Urgent' ranking where it is recommended they are subject to a more detailed risk assessment either as a matter of priority or it is highly recommended. Plantlife states that these plants are 'likely to become a major established pest in the coming decades... becoming a major nuisance in years to come'. In this regard they are pioneering the preventative approach by anticipating future risks to biodiversity.

Another problem solving method is bio-control. In Japan, Japanese knotweed is common but it is not such a problem as it is in the UK, this is due to the presence of natural predator's native to Japan that keep it under control. CABI, a not-for-profit agricultural research organisation, used this fact as common sense methodology to track down a cost saving knotweed remediation solution. They found nearly 200 species of plant-eating insects and about 40 species of fungi that could potentially be suitable control agents. After testing their candidates on 90 different UK plant species, including plants closely related such as bindweeds and important crops and ornamental species, they discovered a sap sucking psyllid called *Aphalara itadori* was a suitable species to trial. It is now being licensed by the UK Government for the biological control of Japanese knotweed in England; this is the first time that biological control of a weed has been sanctioned in the European Union. Could this introduction of bio-control prove to be more costly than more traditional methods of removal? Some people consider this a risky option with the prospect of *A. itadori* sap sucking a wider variety of species than expected. We will have to wait and see.

There are a number of methods for controlling 'aliens' and clearly we as the human race are treating it as a very serious predicament but are we taking the issue of invasive species too far? One could argue that no plant is native to a single particular area and it is only a matter of time before species from one side of the world reach another, after all the earth is an entire ecosystem which encompasses all the plants and animals within it. It is human perception that classifies plants and animals as invasive and problem species, and indeed it could be said that not everyone agrees that the threat to biodiversity is that much of a problem. A recent study by David Pearman, who co-edited *New Atlas of the British and Irish Flora*, and Kevin Walker, a fellow botanist, looked at the occurrence of invasive plants in both towns and the countryside, the objective of their study being to understand if we perceive invasive species to be more prevalent than they actually are because many grow close to human dwellings in urban surroundings. The results showed the spread of these

problem plants, including Japanese knotweed, Indian balsam and Giant hogweed as examples, are centred in towns and suburbs where larger populations of humans exist, and that in the countryside and areas with higher nature conservation value 'aliens' are less common.

Richard Mabey, an eminent naturalist and author, has recently published *Weeds*<sup>5</sup>, an entertaining and educational read that I highly recommend. Mabey writes, 'Like all weeds, exotic invaders only really thrive where there is disturbance, or an absence of long-established plant communities whose complex, space demanding root systems and anciently negotiated chemical relationships can usually repel boarders.' This theory of invasives being able to prosper in only opportunist environments such as town centres and wastelands backs up the results of Pearman and Walkers study. Mabey goes on to state 'there may be a less dogmatic way of evaluating invasive aliens which takes the possibility of their positive contributions into account. I'm attracted to the concept of 'naturalisation' as a rough and ready index of their acceptability.' Here he argues that large numbers of exotic plants have already naturalised amicably amongst our native species, examples of which include species that are now commonly thought of as UK plants, such as Horse chestnut *Aesculus hippocastanum* and Michaelmas daisy *Aster novi-belgii*. Mabey concludes that 'botanical naturalisation - the granting of honorary native status - ought to depend on acceptable and appropriate behaviour, not country of origin'.

The issue of invasive species should not be taken lightly and although there are different viewpoints on the seriousness of invading plants and animals, many of these species have major implications for humans that we should be concerned about, particularly with respect to economic, sustainable development. In conclusion it is my opinion that more preventative work needs to be done to keep ahead of the game, a great example being Plantlife's horizon scanning. This combined with greater public and industry education, just as we endeavour to keep our clients informed of the latest 'alien' species news, will help control the impact of problem invasive species. The word 'problem' species is the important aspect here as I believe that the world is indeed one entire ecosystem and it is only a matter of time before plants and animals reach new environments. It's how we learn to accept the good guys and deal with the bad guys that is important.

## Notes

1. HMSO (1981 as amended) Wildlife and Countryside Act.
2. Griffiths A (2010) Ten years of giant hogweed control. *Conservation Land Management*, Vol. 8, Number 2. British Wildlife Publishing.
3. Pheloung PC (1995) *Determining the weed potential of new plant introductions to Australia*. Australian Weeds Committee Commissioned Report, and, Pheloung PC, Williams PA and Halloy SR (1999) A weed risk assessment model for use as a biosecurity tool evaluating plant introductions. *Journal of Environmental Management* **57**: 239-251.
4. Plantlife (2011) *Here Today, Here Tomorrow – Horizon Scanning for Invasive Non-Native Plants*.
5. Richard Mabey (2010) *Weeds – How Vagabond Plants Gatecrashed Civilisation and changed the Way We Think About Nature*. Profile Books, London.

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# Invasive Weeds:

## A Barrier to Development, Environmental Catastrophe or Manageable Nuisance?

Mark Prout

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### Legislation and Responsibility

**There are currently at least 13 Acts of Parliament that proscribe invasive weeds. These acts deal with the issues surrounding a land owner's responsibility with regard to successful containment and safe, effective disposal.**

The Wildlife and Countryside Act 1981 is the primary source of legislation for non-native invasive species and currently lists over 35 plants that must not be allowed to spread across property boundaries and where prosecution could ensue should that happen.

The Controlled Waste Regulations 1992 along with the Environmental Protection Act 1990 deal with waste classification and safe disposal of, specifically, Japanese knotweed and giant hogweed.

The Environmental Permitting Regulations 2010 (formerly the Waste Management Licensing Regulations) implements restrictions of treatment processes regarding contaminated material.

Other acts that relate to both native and non-native invasive weeds include:

- Site Waste Management Plans Regulations 2006
- Town and Country Planning Act 1990
- The Landfill (England and Wales) Regulations 2002
- Weeds Act 1959
- Ragwort Act 2003
- Highways Act 1980
- Water Resources Act 1991
- Countryside and Rights of Way Act 2000
- Finance Act 2009

### Why Eradicate?

The primary driver for all invasive weed legislation has been to stop the spread of invasive species throughout the UK in order to maintain our native biodiversity and to protect crop production or livestock and horses. Failure to comply with much of the legislation will attract fines or even a custodial sentence, but on a positive note, the Finance Act 1990 creates a tax rebate system for *in situ* treatment of Japanese knotweed.

Due to Japanese knotweed's potential to inflict structural damage to property and hard landscaping however, considerably more attention is paid to ensuring that this weed is properly dealt with when it is found on development land; there are now many instances of mortgages being refused on property where the plant has been identified.

Due to the strength and vigour of Japanese knotweed, combined with its ability to propagate so successfully

it is not surprising that there is such alarm when it is found on a development site.

The spread to, at the very least, every 10 km<sup>2</sup> throughout the UK over the past century or so is explained once it is realised that the plant can grow aggressively to a height of over 3 m with rhizomes that can extend over 3 m, and all from a fragment of as little as 0.7 gram of rhizome.

### What is the Plan?

When determining possible invasive weed treatment options, it is worth considering whether eradication or control that will give you the result that you need. It may be that control is only really going to be possible for some infestations due to the potential longevity of a seed bank and the possibility of re-infestation via channels such as a watercourse, wind or wildlife spreading seeds. So provided spread into the wild is not happening as a result of the landowner's lack of activity, then control may be sufficient.

The size of the problem is also very important. In the case of Japanese knotweed, it may be too expensive to remove a large area to landfill. Conversely, it may be cheaper and quicker to move a very small area to landfill.

Project deadlines can mean that the choice of options is always going to be limited, for example, if the growing season has passed and the deadline is before the next growing season is complete, a mechanical solution will have to be implemented.

It is sensible to think about the surrounding environs. If soil is being removed from site, what will it be replaced with and if an herbicide programme is going to be put into place, could this harm existing and desirable vegetation?

Ultimately though, it is budget which ends up being the main driver for which methodology is chosen. If there is time, herbicide is always preferable,



**Figure 1. A new, viable plant will grow from a fragment of rhizome. The coin is a 10p coin. It is normally agreed that a piece of rhizome as small as a little finger nail can grow into a new plant.**

but if the developer wants a quick result so that he can sell, then a mechanical solution may be the only solution.

## Methods of Treatment for Invasive Weeds

Herbicide treatment is suitable for areas beside water, where there is desirable vegetation and spread onto or from neighbouring land. However, it isn't suitable when there is a tight deadline that leaves insufficient time for it to be effective. Also, subsequent site use, such as a landscaping project might mean that it wouldn't be appropriate to use a residual herbicide until this has biodegraded 18 months later. Most invasive weeds readily respond to an herbicide regime but it is agreed that Japanese knotweed, marestail and horsetail are all more difficult to kill this way and will require very careful application in order to be successful.

With specific reference to Japanese knotweed, mechanical treatment could mean removal from site, burial on site or screening. However, it becomes more difficult to achieve a 100% effective result should there be services on site and the invasive weed has spread across boundaries.

Herbicide techniques can achieve control or eradication. When a residual herbicide is correctly applied using adjuvants and wetters, Japanese knotweed can be killed within one growing season. However, in environmentally sensitive areas, such as close to water or near trees, herbicide choice is limited to glyphosate-based chemicals and it may take two or even three years of careful application to successfully achieve eradication.

Japanese knotweed stem injection is widely used as a method of herbicide application. However, when it is considered that an average sized stand of Japanese knotweed would contain 20 stems per square metre and it is recommended that 2 ml is injected into each stem, it could mean that when scaled up, the rate equates to 40 litres of chemical per hectare. When this is compared to the 5 litres of chemical in open land and 10 litres in forestry (depending on the label), we have to think about what this could mean environmentally. We normally only advocate the use of stem injection where there are very small stands of knotweed in an environmentally sensitive area.

Glyphosate-based treatment as a non-residual, non-selective herbicide



**Figure 2. There is still an extensive rhizome network below these areas of bonsai-type Japanese knotweed plants. This photo shows just how small the leaf area has become and how it will be impossible for the plants to absorb sufficient herbicide into the rhizome in order to kill them. It could take a number of years before this plant would be in a strong enough state for a new herbicide programme to work effectively.**

will take a minimum of two to three years to be totally effective and it is likely that annual spot treatment will be required thereafter. This method is only likely to give control. For example, there are stands of knotweed in Cornwall that were first treated in 2000 and are still alive. The problem is that it restricts leaf size, meaning that there is less surface area for the herbicide to be absorbed into the rhizome of the plant, allowing it to remain viable. Non-selective herbicides are suitable for use on water provided it says so on the label and a WQM1 (Water Quality Monitor 1) has been approved by the Environment Agency.

Herbicide treatment is normally cost effective when compared to



**Figure 3. A £4 handheld spray can of herbicide from a DIY store has rendered this Japanese knotweed incapable of being able to produce enough leaf area for further herbicide treatment to be effective. The resulting excavation and removal to landfill cost £18,500.**

excavation. But it can also limit options if it has not been applied correctly and this particularly applies to Japanese knotweed.

## Case Study 1: Dolcoath, Camborne, Cornwall

We were first contacted by Pell Frischmann in January 2007 about this site. We established that the Japanese knotweed covered approximately 6,500 m<sup>2</sup> across the site in over 50 separate stands. There was also an area of giant horsetail that extended to approximately 800 m<sup>2</sup>.

There had been a variety of herbicide treatments to the Japanese knotweed, followed by excavation and mass disturbance which mean that all plants were bonsai, mutated or damaged. There was the added complication that trial pits had been excavated to a depth of 4 m and then back-filled with rhizome contaminated material so the rhizome networks were growing at a deeper level than would normally be expected.

The problem was solved by developing a bespoke methodology that cleaned the soil and allowed all material to be retained on site. Screening apparatus was developed in order to breakdown soil into three fractions from which almost all viable rhizome could be removed.

Over 160,000 tonnes of soil were screened during a seven month period and all processed soil was reinstated throughout the entire site area.

Success was proven by the follow up herbicide regime during 2009/10 treated only 27 individual plants.



**Figure 4. 800 m<sup>2</sup> area of giant horsetail**







# *Dikerogammarus villosus*:

## An Anglian Perspective

Drew Constable MIEEM and Nina J Fielding MIEEM  
Environment Agency

### Introduction

**T**he latest non-native aquatic invertebrate to arrive in the UK is the highly invasive amphipod *Dikerogammarus villosus*, commonly known as the 'killer shrimp'. The first report of the species within the UK was on 3 September 2010 at Grafham Water, Cambridgeshire, a drinking water reservoir with an area of 6.3 km<sup>2</sup>. The preliminary identification was made by Environment Agency biologists at Brampton before subsequently being confirmed by amphipod expert Dr D Platvoet, University of Amsterdam. Since then the species has generated much media interest, featuring on the BBC programme *Countryfile* and being reported on within a range of national newspapers. The species has since been found at two further locations in Wales; Cardiff Bay and Eglwys Nunydd reservoir (Port Talbot) on 25 and 26 November 2010 respectively.

### Ecology

The species is native to the Ponto-Caspian region of Eastern Europe, and over the last 15 years it has successfully invaded aquatic systems across Western Europe including Germany, the Netherlands and France. The successful invasion of this exotic amphipod is attributed to its plasticity in tolerating a range of environmental conditions, its high reproductive capacity and intense predatory behaviour. This has led to the species being listed as a Water Framework Directive UK Technical Advisory Group (WFD UK TAG) red list high impact species and in the Top 100 worst alien species in Europe ([www.europe-aliens.org](http://www.europe-aliens.org)). In terms of its specific ecological traits, the species has been reported to endure a wide range of temperatures (up to 23°C) and salinities (20‰) (Brujns *et al.* 2001), and



Figure 1. Grafham Water, Cambridgeshire

is known to exploit a diverse food base ranging from detritus and coprophagy (re-digestion of faeces) to juvenile fish (Platvoet *et al.* 2009). Females are able to produce up to 200 young every two weeks (Dick 2010), and can reach sexual maturity early, at 6 mm in length. This can be achieved very quickly, with the species exhibiting exceptional growth rates of up to 2.6 mm in two weeks during spring (Devin *et al.* 2004). Its life history therefore gives the species

a competitive advantage where small pioneer populations can rapidly become dominant in newly invaded waters.

The most publicised and perhaps most significant characteristic of the species is its voracious predatory behaviour, where scientific studies have shown *D. villosus* to consume, attack and injure a range of macroinvertebrate victims, including water hoglouse, mayflies, damselflies, water boatmen and other



Figure 2. *Dikerogammarus villosus* in various life stages from Grafham Water, September 2010 (Photograph copyright of Merino EMG Ltd)

amphipods (Dick *et al.* 2002). Stable-isotope analysis has also indicated that the species is on the same trophic level as fish (Marguiller 1998). The species is therefore a direct threat to native biological diversity and could adversely affect the structure and function of freshwater ecosystems. This has already been witnessed in the Netherlands where *D. villosus* has been observed to eliminate and replace the native amphipod crustacean *Gammarus duebeni*, and *Gammarus tigrinus*, a North American invasive amphipod (Dick and Platvoet 2000). Now present in the UK, it is feared that similar displacements and local extinctions may occur with *Gammarus pulex*, our native amphipod, being most vulnerable, having coinciding habitat preferences (MacNeil and Platvoet 2005). These adverse impacts could also extend to fish populations, with *D. villosus* being observed to predate on the eggs and larvae of the bullhead *Cottus perifretum* (Platvoet *et al.* 2009), and show a consumption preference for fish eggs, when presented *Chironomus* larvae, *Asellus aquaticus*, *Echinogammarus stammeri* and the fish eggs of *Coregonus lavaretus* (Caselatto *et al.* 2007).

## Biosecurity

Since the discovery of *D. villosus* at Grafham Water there has been a rapid and co-ordinated response, led by a Scientific and Technical Advisory Group, in order to prevent further spread of the species. This threat of spread was accentuated by the high population numbers found throughout the reservoir, with densities reaching approximately 390 m<sup>-2</sup> in reservoir margins (MacNeil *et al.* 2010). The response has three main areas of focus:

1. implementation of control measures;
2. improving understanding and awareness; and
3. enhancing knowledge and research efforts.

In response to managing the incident at Grafham Water, biosecurity measures were quickly introduced to minimise the risk of spread to other water bodies. Grafham Water, which is owned by Anglian Water Services Ltd, is a popular location for leisure activities, notably fishing and boating. The reservoir is stocked with trout, which attracts fly fishermen who undertake fishing from boats and from the bank. There are regular competitions which draw anglers from across the UK and from Europe. There is an established sailing club which operates on the reservoir and this too holds frequent competitions

which attract UK and European entrants. Both activities have been identified as potential vectors of spread, with *D. villosus* observed to successfully attach to waders and net equipment in significant numbers, and bury itself in small crevices on boats and trailers. As a result, strict pressure washing, wash down and clean off facilities were introduced by Anglian Water and Grafham Water Sailing Club. These measures are enforced by duty wardens, with a sign in and out policy for all anglers at the fishing lodge. Posters have also been displayed around the perimeter of the reservoir providing guidance for all lake users.

In conjunction with the above control measures, information to improve awareness and understanding about the species has also been disseminated by various mediums. A combination of press releases, identification guides and biosecurity protocols have been prepared and circulated by the Environment Agency, the Department for Environment, Food and Rural Affairs (Defra), the GB Non-Native Species Secretariat (NNSS) and the Freshwater Biological Association (FBA). The importance of raising awareness was most evident from an Environment Agency presentation given by Dr Ian Hirst at an RPS non-native species conference (24 November 2010), which led to the subsequent confirmation of the amphipods presence in Wales (25 November 2010). This was brought about by a member of the audience indicating that he had seen a similar looking species at Cardiff Bay.

In order to provide appropriate interim biosecurity guidance, literature reviews, pilot studies and preliminarily laboratory experiments have been conducted. Initial tests established that the use of the disinfectant 'Virkon' was effective in killing *D. villosus* within two minutes of exposure in a 1% solution. However, since Virkon should not be used close to drinking water supplies, further tests were conducted. The effectiveness of air drying equipment was tested, with the results showing that *D. villosus* is a tenacious species, being able to withstand prolonged periods out of water of up to 15 days, if kept in moist conditions. Preliminary experiments also showed that once the equipment was fully dry, individuals were able to survive for up to 48 hours (Nathan Hall pers. comm.). This demonstrated the ease with which the species could be transported between water bodies. A range of household products have also been tested to establish their effectiveness as suitable biocontrol measures for public use. Despite being successful in killing *D. villosus*,

the time taken to do so (>45 minutes) was considered impractical as a method to be adopted widely. Defra have commissioned the Centre for Environment, Fisheries and Aquaculture Science (Cefas) to investigate the use of disinfectants.

## Monitoring

To investigate the spatial distribution of *D. villosus*, a reactive monitoring programme was devised between the Environment Agency and Anglian Water, which focused on the risk of spread and likelihood of inhabitation. At risk water bodies with confirmed or potential links to Grafham Water were targeted. The vectors identified were boating, water sports, fishing activities, bird movements and fish stocking. Priority was also given to Diddington Brook, which received compensation flow from Grafham Water. Each of the water bodies were then surveyed to establish the presence of *D. villosus* and the suitability of the habitat to support a viable population. The species is known to inhabit sites with boulder, cobble and hard standing artificial substrates, and moderate to slow flow velocities. It also has a well documented association with another invasive Ponto-Caspian species *Dreissena polymorpha* (zebra mussel). The results of the reactive monitoring certified that the species was also present in the compensation channel, which flows into the top end of Diddington Brook, with a low number of *D. villosus* being found amongst a dominant *G. pulex* population. This instigated an intensive survey of the entire length of Diddington Brook (c.5 km), which uncovered no further individuals. The results of the survey revealed that the Brook was generally unsuitable for *D. villosus* inhabitation, with the substrate being predominantly comprised of silt. The presence of *D. villosus* in the compensation channel led to screens being installed at the site to prevent drift and colonisation of downstream watercourses, with the River Great Ouse being a direct recipient. Following on from this, compensation flow to the Brook was ceased, with water being re-circulated back into the reservoir. This created a closed loop system, preventing further transfer of the species. No *D. villosus* have been found in Diddington Brook despite frequent monitoring.

A subsequent outcome of the reactive monitoring programme was the identification of sites with the highest risk of colonisation. These sites are now actively monitored on a regular basis. To aid monitoring activities, baited traps were developed, based around a fine minnow mesh trap design (see Figure 3).





**Figure 3. Baited trap design to capture *Dikerogammarus villosus***

The traps were developed to exploit the predominantly nocturnal behaviour of *D. villosus*, being deployed overnight to help increase the probability of capture. The trap design requires the insertion of cobble and pebble substrate to provide a suitable habitat for the species, and the use of fish-based food products or cat food as bait to attract them. The traps have been successfully trialled in Grafham Water and have repeatedly captured other amphipod species, including *G. pulex* when deployed at routine monitoring sites, as well as other macroinvertebrate groups. As of 17 March 2011, no further populations of the species have been found at any of the monitored locations.

## Wider Implications

The arrival of *D. villosus* and its potential to colonise other water bodies has significant implications for our ability to achieve good ecological status or potential for the EU Water Framework Directive (WFD). Macroinvertebrate communities are used as part of the classification process for water bodies, based on the water quality Biological Monitoring Working Party (BMWP) index. *D. villosus* has the potential to adversely affect the composition and abundance of macroinvertebrate communities, due to competition and predation pressures. This could resultantly undermine the accuracy of the scores produced by the index and compromise the achievement of good ecological status or potential. The effects would not be limited to WFD classification but would also impact upon other biotic metrics used for aquatic assessment such as the Lotic-invertebrate Index for Flow Evaluation

(LIFE) and Community Conservation Index (CCI).

## Looking Ahead

The sudden appearance of *D. villosus* in the UK required a rapid monitoring response and understanding of the species. Looking ahead we expect our knowledge and understanding of the species to increase, which will improve the advice and guidance that we provide on key issues such as biosecurity and the measures we take in helping prevent its spread. This will be achieved by continuing to undertake laboratory and field-based studies, and sharing our experiences with other organisations.

## Further Information

The central information point for the invasive shrimp is the GB Non Native Species Secretariat (NNSS) website: <https://secure.fera.defra.gov.uk/nonnativespecies/alerts/index.cfm?id=3>.

This includes information on how to identify the species and interim guidance on biosecurity measures for boaters and anglers. The website will be periodically updated as new information and guidance becomes available.

If you suspect you have found this species please send a record, including a photograph to: [alert\\_nonnative@ceh.ac.uk](mailto:alert_nonnative@ceh.ac.uk) or report it through the NNSS website [www.nonnativespecies.org](http://www.nonnativespecies.org).

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# The Myths of Japanese Knotweed:

## A Critical Appraisal/Review of the UK Knotweed Industry

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**J**apanese Knotweed is a never ending subject of incomprehension, fear and nonsense. To illustrate this statement, I give you one example: Isn't it curious to read on the one hand information about Japanese knotweed stating that it can grow through foundations, while on the other hand we are advised to use a geo-textile membrane to remediate the knotweed? So how come Japanese knotweed is able to penetrate through 20 cm of concrete and not be able to grow through a 3 mm thick piece of plastic?!

When the knotweed legislation came into force about a decade ago, it shook the construction industry as a whole. While common sense prepared us to provide remediation techniques for chemical pollutions (i.e. hydrocarbons, cyanide, etc.) because they smell, have an unusual colour and affect human health and the environment, suddenly we had to consider in the equation a 'vegetarian' threat. At the time, there was no knowledge available, consequently no knotweed experts and in order to provide support to the construction industry we had to resort to making assumptions.

As often happens in such conditions, the assumptions did not capture the realistic threat of Japanese knotweed and it is under those circumstances that a new knotweed remediation industry emerged hiding behind a screen of fear, inconsistency and myths.

Probably the most recurrent pitfall in the knotweed industry is the sensitive issue of guarantee. It is perfectly understandable for a developer to seek some kind of re-assurance. After all, they are taking a large amount of risk to see their projects through.

Fundamentally, there are currently no insurance companies willing to cover works associated with Japanese knotweed, yet it is not uncommon to be offered guarantees/warranties as they represent obvious powerful marketing tools. So what are those guaranteed schemes proposed by most of the knotweed industry?

Well, if we scrutinise the various schemes, we can classify them into predominantly three categories. They are:

### 1. Professional Indemnity (PI)

- A PI policy is commonly obtained for organisations and individuals that provide advice to their clients. Therefore claims arising following a survey where it is alleged that due to negligent advice the client has suffered a financial loss are covered by a PI policy.
- However, in the circumstances that a Knotweed re-growth is identified following a remediation exercise, the insurance company will declare the defect as outside the scope of the PI policy as this would be classed as defective workmanship.

### 2. Public Liability (PL)

- A PL policy will cover third party property damage and bodily injury claims. The so-called knotweed guarantees under PL offered by contractors are probably the most ludicrous guarantee of all. The intention of the Public Liability Insurance is to provide an indemnity in the event of a negligent act by the contractor that can be tied to a specific event/act within the period of insurance which results in property damage/bodily injury. No cover is provided for property being worked upon or the actual contract works.

### 3. Performance Bond

- A Bond Contract, Performance or Surety Bonds are guarantees to pay the direct loss suffered by a party (the employer) as a result of a breach of contractual obligations by the other party (the contractor). In essence, this means that in the event of default by the contractor, usually as a result of insolvency, the employer will be able to recover the necessary additional costs they incur from the surety up to the level of the bond. It is not the intention of these types of bonds to guarantee the works carried out by the contractor.

Darryl Smith, Senior Insurance Broker for COL Direct, says: "We have carried out in-depth investigations with the insurance market as a result of an increasing number of enquiries from our clients. In our opinion, due to the lack of understanding of the knotweed removal industry, no insurer is prepared to underwrite a guarantee following a removal project at the present time."



Damage done by Japanese knotweed (this page and next)

All photos: Sean Hathaway





Taking into consideration the above, one could wonder if misleading practice pre-contract could lead to poor site knotweed management. Worst of all, there are knotweed contractors that do not hesitate to provide guaranteed remediation techniques, which do not meet the statutory requirements. We are talking here about methods involving solely the use of herbicide where it is claimed that the knotweed will be eradicated within one growing season.

Mark Heggie, Senior Waste Officer from the Scottish Environment Protection Agency (SEPA), says: "SEPA's guidance recognises the threat of knotweed rhizomes and their ability to remain viable for long periods of time following the application of herbicide. The invasive and combative nature of the plant means that treatment with herbicide alone is unlikely to provide a quick fix solution and it takes several years to achieve successful eradication."

In order to understand how exponential the liabilities for a developer could become when commissioning a six month guaranteed spraying/stem injection eradication programme or similar, let us consider the following example:

Developer A is commissioning a six month guaranteed herbicide programme. After six months, developer A is advised that his/her site is free of knotweed. He/she decides to sell the surplus top soil from his site to Developer B, which also included the treated knotweed area. After a few weeks, the knotweed reappears at Developer B's site. The liabilities for Developer A will be as follows:

1. The commercial relationship that A has nurtured with B is likely to be severed.
2. Since bad news travels fast, the commercial relationships that A has with other stakeholders in his/her industry could also be severed.
3. B will request prompt action, which is likely to result in the most expensive and often cost prohibitive method (*i.e.* landfill site disposal) as B will be extremely vigilant and for peace of mind will require the duty of care process to be followed as per the legislation.
4. Should the incident be recognised by the Environmental Regulator or should B not be satisfied by the remedial action proposed by A, it could be that the issue is referred to a court proceeding. Obviously, the statutory requirements were not met and because:
  - a. the knotweed has escaped from the A site, A may under the Wildlife and Countryside Act 1981 face criminal prosecution; and

- b. the duty of care was not followed, A may under the Environmental Protection Act 1990 be subject to unlimited fines in addition to the cost of cleaning up.

5. Obviously, any court proceedings are in the public domain, and as a result A's profile may be affected further.

As for the fate of the knotweed contractor, his/her solicitors will likely successfully argue that his/her client is not responsible for the above as it is not possible to ascertain whether the knotweed cross-contaminations are the result of his/her client's works or the consequence of other site activities that occur at site A.

Greig Honeyman, Senior Partner for Fyfe Ireland LLP says: "Solicitors require to be alert not only to the presence of Japanese knotweed in development sites but also whether the eradication of Japanese knotweed in such sites has been effective. Given that guarantees are not available we need to examine critically who has carried out eradication works and the manner in which eradication has been done. The Environmental Regulators could provide additional reassurance that the eradication methods used were adequate. The days of assuming that these matters have been taken care of by any developer at the time of site clearance have gone. Certainty is the order of the day."

Trevor Renals, Invasive Species Adviser for the Environment Agency adds: "It is very hard for a developer to evaluate the diverse methods and success claims on offer for knotweed management. The knotweed code of practice provides information that would allow a developer to make an assessment of the technical claims made by a potential contractor. However, it is notoriously hard to prove that a treatment has been unsuccessful and that subsequent regrowth isn't due to either neighbouring untreated ground or imported topsoil. Companies are understandably often reluctant to raise awareness of contractors that have failed to provide good knotweed management. I would encourage developers who despite being able to demonstrate good environmental practice on their sites are the victim of disreputable knotweed contractors, to pursue legal action against them."

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# Science for Action:

## Perceptions of the Role of Research in Invasive Species Management

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**Access to scientific information from research activities is important in planning effective invasive species management programmes but can be difficult to apply in practice. We explored information sharing in the UK invasive species community to identify ways in which the utility of research information to practitioners working with invasive species could be improved, and highlight some of the existing resources. Organisations like the Institute of Ecology and Environmental Management (IEEM) have an important role to play in enhancing information sharing between researchers and practitioners working with invasive species.**

Invasive species are an issue of global concern due to their impacts on biodiversity, society and the environment. Effective management is important for the mitigation of these impacts. When new introductions of problematic species are detected early, eradication is an option; otherwise ongoing control aimed at mitigating the impacts of invasive species is usually necessary. Control options generally consist of biological (using natural enemies), chemical (e.g. herbicide or pesticide), physical (e.g. shooting or hand pulling) or mechanical (e.g. trapping or mowing) management of populations.

### Informing Invasive Species Management

Practitioners take into account a range of factors to make informed decisions regarding the management of invasive species. These may include: any site characteristics that may affect management; relevant legislation affecting sites or species (designations), or management activities (e.g. pesticide or herbicide regulations); and the physical and economic resources available. Site managers also need to assess the extent of the problem to determine the level of management response required.

Depending on the stage of the invasion process, the type of information required by practitioners is likely to vary. Information on current locations, spread and identification may be important for new introductions such as the invasive sea squirt *Didemnum vexillum*, whereas information on ecology and control may be more useful for established species such as Himalayan balsam *Impatiens glandulifera*.

Access to scientific information can be important in selecting the most effective options for managing invasive species (see Box 1 for examples). Despite this, there appears to be a gap between research and implementation that makes it difficult for people to apply research findings in practice, even when the research is applied in focus (Esler *et al.* 2010). Concern has been raised that practitioners are often unable to access scientific information, and other sources may not always provide impartial evidence of the effectiveness of different management options.

### Perceptions of Invasive Species Research Case Study

We used a brief questionnaire to explore perceptions of research information amongst UK stakeholders (41 respondents including practitioners, researchers and policy stakeholders) working with invasive species. The questionnaire was distributed in hardcopy at the

GB Non-Native Species Secretariat Stakeholder Forum and the British Ecological Society Invasive Species Group Conference during 2009. Completed questionnaires were collected at the events and then data were entered into spreadsheets for analysis.

The most widely used sources of information by practitioner respondents (n=15) looking for invasive species information were general internet searches (e.g. Google), closely followed by seeking information from colleagues (Figure 1). Specific invasive species websites were the third most frequently used resource, followed by existing networks (such as e-mail lists, fora and specialist groups), then journal articles.

We asked all respondents to read a series of statements and rate their level of agreement with each on a five point scale (from strongly agree to strongly disagree).

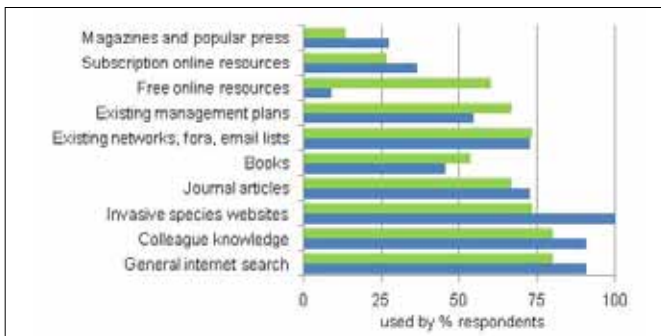
- Most respondents felt that invasive species research influenced practice.
- Practitioners did not feel that research findings were accessible, whereas policy-makers and researchers were not sure.
- There were mixed perceptions as to whether research was responsive to practitioner needs.
- Policy-makers thought practitioners were good at sharing information with other practitioners, although researchers did not think they were and practitioners themselves were not sure.
- Most respondents felt that existing networks such as e-mail lists, fora and groups provided a good source of information about invasive species.

#### Box 1: The Contribution of Research to Invasive Species Management

There are several ways in which research can contribute to our understanding of invasive species. These may include:

- *Large scale studies and manipulative experiments*  
These can explore how factors such as climate or altitude affect invasive species across their range (both native and introduced). This can help us to understand invasive species ecology, and how other factors may impact on invasive species and their behaviour.
- *Experimental comparisons of control methods*  
Experiments assessing management options, particularly *in situ* studies, can inform management by identifying new or particularly effective options for managing or controlling invasive species.
- *Syntheses of existing research and practice data*  
Syntheses can explore and reanalyse groups of studies to help determine the most effective options for management, for example by using statistical analysis. Systematic reviews are an example of this; for more information see [www.environmentalevidence.org](http://www.environmentalevidence.org).
- *Bio-geographical and mathematical models*  
Models can be used to predict which species may become problematic or be introduced in the future and identify priorities for management. They can also be used to explore the impacts of other drivers such as climate change or changing land use patterns on invasive species.





**Figure 1. Comparison of resource selection by UK practitioners (green bars) and policy decision-makers and advisors (blue bars) working with invasive species**

### Suggestions for Making Research More Useful To Practitioners

Respondents to the questionnaire identified ways in which research could be made more useful to practitioners. Respondents were of the opinion that practitioners should be involved in setting the research agenda, and work with policy-makers and researchers to identify priorities for research. They thought that this would increase the proportion of research that is relevant to policy and practice. Other ways identified to ensure a research base relevant to practice included: increased partnership working; involvement of practitioners in the research process; better co-ordination of research, policy and practice.

Improving communication and knowledge transfer in all directions was seen as key to making research more useful to practitioners. In particular, enhancing the communication of research findings was identified as a key area. Specific recommendations included:

- The development of practical management solutions.
- More definitive (and consensus) outcomes rather than a call for research, particularly in the case of management or control research.
- Use of more accessible terminology and less jargon within scientific publications.
- Increased accessibility to research findings.
- Wider dissemination beyond academic journals.
- Clearer pointers of where to find relevant information.

### Implications

Practitioners and researchers who are gathering valuable management data through their activities should continue to share the information using existing networks, e-mail lists and groups, and through practitioner-oriented magazines like *In Practice* to ensure that it reaches the people who are likely to apply the information during management. The recent development of several open access journals on biological invasions is helping to make information from both practitioners and researchers more widely available (see Box 2).

Researchers planning projects with practical outcomes should consider working with practitioners and other local stakeholders to ensure the outcomes are as relevant and useful to practice as is feasible. There is a need to link researchers with practitioners. Researchers need to consider disseminating their findings outside of traditional academic journals. Organisations whose memberships span both areas, such as IEEM, play an important role in facilitating information transfer through their conferences and publications.

Through wider engagement with existing networks, researchers can more easily reach the potential end users of their information, and practitioners can have a greater role in influencing research activities.

### BOX 2: Information Starting Points

The following section contains examples of sources which were identified by respondents as being useful sources of invasive species information and may provide a useful starting point for information.

#### UK sources of invasive species information

- **GB Non-Native Species Secretariat** [www.nonnativespecies.org](http://www.nonnativespecies.org)  
Contains useful information about GB invasive species including fact sheets, identification, risk assessments, species alerts, links and details for local action groups and projects
- **Invasive Species Ireland** [www.invasivespeciesireland.com](http://www.invasivespeciesireland.com)  
Useful information on invasive species in Ireland, including species alerts
- **British Ecological Society Invasive Species Group** [www.britishecologicalsociety.org/invasive](http://www.britishecologicalsociety.org/invasive)  
Hold a biennial conference on invasive species and have an e-mail list, BES-Invasive
- *Many other organisations have information about invasive species on their websites*

#### International sources of invasive species information

- **Delivering Alien Invasive Species In Europe** [www.europe-aliens.org](http://www.europe-aliens.org)  
DAISIE website contains searchable data on invasive species and experts in Europe
- **Global Invasive Species Programme (GISP)** [www.gisp.org](http://www.gisp.org)  
The GISP website contains links to reports and databases on invasive species
- **Invasive Species Specialist Group** [www.issg.org](http://www.issg.org)  
A group within the IUCN Species Survival Commission, which maintains an e-mail list, Aliens-L, publishes the Aliens newsletter and maintains the Global Invasive Species Database

#### Sources of free online scientific information

- **Conservation Evidence** [www.conservationevidence.com](http://www.conservationevidence.com)  
Practitioner journal and searchable summaries of published studies
- **Environmental Evidence Library** [www.environmentalevidence.org](http://www.environmentalevidence.org)  
Systematic reviews on the effectiveness of conservation actions
- **Biological Invasions journal** <http://www.springerlink.com/content/103794/>  
Abstracts free but subscription required for most full text articles
- **Open access journals of invasive species information**  
Aquatic Invasions [www.aquaticinvasions.ru/](http://www.aquaticinvasions.ru/)  
Management of Biological Invasions [www.managementofbiologicalinvasions.net](http://www.managementofbiologicalinvasions.net)  
NeoBiota (just launched) [www.pensoft.net/journals/neobiota](http://www.pensoft.net/journals/neobiota)

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# Recording Invasive Species Counts (RISC) – One Year Since Launch

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## Recording Wildlife

**It is estimated that up to 60,000 people routinely record biodiversity information in the UK. Most of this effort is voluntary and is organised through about 2,000 national societies, recording schemes and the network of local record centres. The Government, through its agencies also collects biodiversity data. This means that a huge amount of information exists and an increasing amount of data is now being shared through the National Biodiversity Network (NBN) Gateway - <http://data.nbn.org.uk>. The NBN is a collaboration of the UK's wildlife organisations, the Government and country agencies, local record centres and many voluntary groups, all of whom are committed to making biodiversity information available.**

The NBN Gateway currently holds over 63 million species records and provides an easy point of access to a very large amount of species data for the UK. It allows the data to be used in many different ways, but in the broadest terms it enables users to search for particular species, to look at a specific area for the species that exist there and also to see how distribution has changed over the years.

## Non-Native Species

Over the last century there has been a dramatic increase in the movement of non-native species around the world. The total for Britain is estimated to be in excess of 2,500 established species. Most of these non-native species have no, or limited, negative effects. However, a minority create serious problems and are hence termed 'invasive non-native species' (INNS). INNS are considered to be one of the greatest threats to biodiversity and also impact on the economy and society.

The NBN Trust facilitates the development of the NBN and under the NBN Trust's 2008-2011 contract with Defra. The RISC (Recording Invasive Species Counts) project

was developed to increase participation in recording invasive non-native species and to encourage greater understanding of them.

The Biological Records Centre (BRC - [www.brc.ac.uk](http://www.brc.ac.uk)) within the NERC Centre for Ecology and Hydrology (CEH) is part of the NBN and is a custodian for data provided by the volunteer schemes and societies led by taxonomic experts. BRC supports the schemes and societies through a variety of mechanisms, from managing data to hosting websites. The schemes and societies have been instrumental in contributing information and data to a national database - the GB Non-native Species Information Portal. This is a Defra-funded collaborative project led by CEH, with the British Trust for Ornithology and the Marine Biological Association and is available through the Non-Native Species Secretariat website. RISC is a component of this portal. An alert system has also

been established within the portal which allows people to report the occurrence of species which are considered particularly high risk, such as the killer shrimp, *Dikerogammarus villosus*.

## The Importance of the Public and Volunteers

Non-native species are of particular interest to the public and media. The aim of RISC is to build on the success of the Harlequin Ladybird Survey ([www.harlequin-survey.org](http://www.harlequin-survey.org)), which has been successful, primarily, because of the involvement of the public and volunteers in registering their sightings. These data have enabled the spread, distribution and ecology of this species to be studied at a level of detail that would not have been possible without mass volunteer involvement.

The RISC project originally selected six invasive non-natives with which to engage

The screenshot shows the NBN Gateway interface for a grid map of records for American Skunk-cabbage (*Lysichiton americanus*). The page title is "Grid map of records on the Gateway for American Skunk-cabbage (*Lysichiton americanus*)". Below the title, there is a text box explaining the map and a search bar. The main content area is divided into two columns: "Customise your map" and "Preview of your map". The "Customise your map" section includes dropdown menus for "Region" (GB and Ireland), "Vice counties" (None), "Resolution" (10km), "Grid overlays" (None), and "Other overlays" (None). The "Change dates and colours" section includes "Colour schemes" (Fixed), "Preset dates" (Select dates), and "Date 1 (top)", "Date 2 (middle)", and "Date 3 (bottom)" with "from" and "to" fields. The "Preview of your map" section shows a map of the UK with red dots representing records. A "10km squares legend" indicates "Present in 10km squares". At the bottom, there are buttons for "large map", "printable map", "download squares", and "download data".

**NBN Skunk cabbage grid map**





**American bullfrog**  
Photo: GBNNS

the public and allow them to record their sightings online.

Thus for the launch in March 2010, three animal and three plant species were chosen for recording – Muntjac deer *Muntiacus reevesi*, Zebra mussel *Dreissena polymorpha*, Chinese mitten crab *Eriocheir sinensis*, Water primrose *Ludwigia grandiflora*, Tree of heaven *Ailanthus altissima* and American skunk cabbage *Lysichiton americanus*. RISC runs the surveys in association with the relevant national recording schemes and societies for the selected species – the People's Trust for Endangered Species, the Mammal Society, the Marine Biological Association, the Conchological Society, Amphibian and Reptile Conservation, the Food and Environment Research Agency and the Botanical Society of the British Isles. Involving these societies is pivotal to the success of RISC and the project could not run without them.

## Why These Species?

The animal and plant species were chosen for a variety of reasons.

For Muntjac deer, a species widely established in southern and central Britain, the main interest is in the northward range expansion. For Zebra mussel, after a lengthy period of stability, there are signs of recent expansion which should be tracked. Chinese mitten crab has few competitors and can seriously affect crayfish and damage river banks. Its spread needs to be closely monitored.

In Britain, Water primrose is currently the rarest of the original six RISC species, but the most invasive. The Non-native Species Secretariat (the government body with responsibility for non-native species issues) has received an increasing number of recent sightings and is very keen to know of any new sites with this species. Some invasive species are faring better as the climate warms, and this may apply to Tree of heaven.

American skunk cabbage is probably the least well-known of the six species, and its impacts on native species are poorly understood. It is hoped that the data

collected by RISC will help scientists learn more about the ecology of this plant in Britain.

The number of species in the RISC project has now been increased to fourteen and it is anticipated that more species will be added over time.

1. Western conifer seed bug *Leptoglossus occidentalis*
2. Rhododendron leafhopper *Graphocephala fennahi*
3. Water primrose *Ludwigia grandiflora*
4. Muntjac deer *Muntiacus reevesi*
5. American skunk cabbage *Lysichiton americanus*
6. Chinese mitten crab *Eriocheir sinensis*
7. Zebra mussel *Dreissena polymorpha*
8. American bullfrog *Lithobates catesbeianus*
9. Water fern *Azolla filiculoides*
10. Floating pennywort *Hydrocotyle ranunculoides*
11. Citrus longhorn beetle *Anoplophora chinensis*
12. Tree of heaven *Ailanthus altissima*
13. Southern green shieldbug *Nezara viridula*
14. Wakame *Undaria pinnatifida*

## How Does the RISC Project Work?

Recorders are asked to upload a photo of their sighting, and these are then checked and verified by the relevant recording society. This ensures that high quality data is uploaded to the NBN Gateway.

The following information is available on the RISC website:

- Information and images for the species – including species fact sheets
- Online recording forms
- Links to many other surveys for non-native species

This project is contributing to our understanding of the distribution and ecology of a number of invasive non-native species, making every record received very important.

Records can be uploaded and more information found by visiting: [www.nonnativespecies.org/recording](http://www.nonnativespecies.org/recording)

RISC is co-ordinated by the National Biodiversity Network Trust and Biological Records Centre (part of the Centre for Ecology and Hydrology), in partnership with recording schemes for the invasive animals and plants. The project is funded by Defra.

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The screenshot shows the NBNSS website interface. At the top, there are logos for Defra, the Scottish Government, and the National Biodiversity Network Trust. The main content area is titled 'Muntjac Deer' and includes a 'Submit a RECORD' button. Below this, there is a gallery of photos showing muntjac deer in various habitats. The page also contains text about the species, including its habitat, origin, and identification features. A 'Quick links' section provides access to recording forms, galleries, and other resources.

**NBNSS Muntjac screenshot**

# The Habitats Directive -

## A Different Environmental Assessment Language

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### Introduction

**T**he Habitats Directive and related UK legislation (The Habitats and Species Regulations) are often seen as a major impediment to resolving development control issues. On many occasions I have been approached with what appears to be an intractable problem. On the one hand, consultants for a developer believe that their proposals will not have a detrimental environmental impact and that the biological interest of a Special Protection Area (SPA) or Special Area of Conservation (SAC) will not be impaired by the loss of a narrow strip along its edge. The statutory conservation agency on the other hand argues that this loss could have an adverse affect on the site's integrity.

Who is right and how can a solution be secured? More often than not, the developer and their consultants will set out to use ever more elaborate mechanisms to prove that there will not be an adverse affect. Meanwhile, both the developer and the competent authority will become increasingly exasperated with statutory conservation agency position. Consultants, *i.e.* the experts, have offered an opinion that should allow the proposal to be consented and yet some 'jobsworth' in that agency is challenging the consultant's view. How can the statutory conservation agency argue that there might be an adverse affect when all of the science suggests that there will not be an adverse affect?



**Figure 1. Foreshore at Barton on Humber. In this case, the toe of the sea wall has been extended by about 2 m over several hundreds of metres, reducing the extent of usable inter-tidal and compounding coastal squeeze problems that are illustrated by lowered mudflat heights and exposure of the toe of the wall (thus requiring remedial action).**

Photo: Roger Morris

The reality is that the statutory conservation agency is right to make a judgement that it may not be possible to ascertain no adverse affect. Meanwhile, the consultants may have an equally valid viewpoint. How is it that both parties are potentially right and yet there is impasse? The reason is simple: they are talking different languages. The consultant is invariably talking Environmental Impact Assessment (EIA) and the conservation agency is talking Habitats Directive assessment. The two are far from synonymous; indeed they differ as greatly as English does from Dutch. They have several common roots but are expressed and constructed in ways that make them utterly unintelligible to opposing native speakers even though odd words or phrases are recognisable in both languages.

Some while ago, I described the concept of 'appropriate assessment' and outlined its nuances and objectives (Morris 2008). Since then it has become increasingly apparent that there is also a need to explain in greater detail how the process of assessment works. So, by way of explanation I offer the following conceptual case.

### Conceptual Case

Let us use a site that comprises both a SPA and a SAC as our example. The development is a proposed new sea wall that involves building defences seaward of the existing line. This example is useful because there are close parallels between such developments and road-widening schemes.

For convenience, let us make our site an estuary where the boundary lies at the top of a sea wall. That estuary comprises several discrete features that must be considered in the light of a proposed development. They might include:

- inter-tidal mud and sand flats;
- Atlantic salt meadows (saltmarsh);
- sub-tidal sandbanks;
- estuaries as a feature in its own right;
- a migratory waterfowl population of 20,000+ birds;
- a suite of internationally migratory bird populations; and
- several Annex II fish species (*i.e.* lampreys, shads or salmon).

There is therefore a matrix of interest features and possible impacts that can be compared. And, there **ought** to be a set of defined **conservation objectives** available from the statutory conservation agency. If conservation objectives are not available, then the subsequent process becomes increasingly difficult, so the consultant working on a project must make sure that these objectives are made available so that the assessment process can proceed. They should not adopt objectives published by the Joint Nature Conservation Committee (JNCC), nor should they write their own.

The assessment process is wholly dependent upon the conservation objectives and an accompanying favourable condition table in which the key attributes are defined<sup>1</sup>.



Each stage of the assessment depends upon a simple yes/no process. The question that must be asked is: Can it be ascertained that there will not be an adverse affect on site integrity? If the answer is yes, then there will not be a problem. If the answer is no, then the question of proof or degree of risk may enter the equation, but fundamentally the precautionary nature of the question demands that if it cannot be ascertained that there will not be an adverse affect on site integrity then subsequent tests of alternatives and imperative reasons of overriding public interest (IROPI) must be applied.

## The Conservation Objectives

Conservation objectives are designed to make sure that the onus is not on every blade of grass or upon absolute numbers of waterfowl or fish. The critical feature of the objectives is to establish whether there is a sufficiency of habitat and whether that habitat is maintained in its optimum condition to support the assemblage of interest. In the UK these tests are especially important because SPA/SAC (and Ramsar) designations are underpinned by a scientifically rigorous designations process. Objection to Site of Special Scientific Interest (SSSI) designations and to subsequent SAC/SPA designations cannot be for socio-economic reasons; they must be strictly scientific reasons. So, once the boundary is established, its scientific validity has already been tested.

The extent of the site is therefore a fundamental component of the conservation objectives for any SAC/SPA. Boundaries are frequently challenged and tightened to the limit of the scientific interest and in the end this means that very little scientifically irrelevant extent exists and there is absolutely no wriggle room. This could be regarded as a failing of the UK system, but the continental alternative brings other disadvantages that must be debated elsewhere. So, any proposal that involves an incursion into the defined boundary will inevitably lead to a loss of extent and consequently there is the potential for a conclusion of 'it cannot be ascertained that there will not be an adverse affect on site integrity'. This is a numerical and not an ecological judgement that has to be especially rigorous in the UK because the boundaries are so tightly defined. That may not be the case elsewhere in Europe where boundaries often resemble those of national parks which incorporate abiotic features.

Other conservation objectives will focus on maintenance of the extent of particular habitats necessary for the well-being of particular assemblages, or perhaps the presence of features such as undisturbed roosts, breeding or feeding grounds that are essential for part of an animal's behavioural cycle. The absolutes of extent in highly mobile environments are often avoided by the reference to objectives 'subject to natural change', which gives some scope for pragmatism, but not much.

A development that causes a loss of extent, or which changes patterns of accretion and erosion certainly has the potential to lead to a judgement that 'it cannot be ascertained that there will not be an adverse affect on site integrity'. If it exacerbates coastal squeeze then even if the impact is small at the onset, ongoing processes will magnify the impact. Some pragmatism may be possible where the impacts are extremely small, but the scale of the impact must be small enough not to be detectable. Certainty is the key and the European Court Judgement in respect of cockling within the Waddensee<sup>2</sup> clearly states that there must be absolute certainty that there will not be an adverse affect.

This places enormous pressure on statutory conservation agency staff to establish certainty and at least some of this decision-making will depend upon years of experience. High turnover amongst staff dealing with these issues makes this difficult. The emphasis placed on valuing the skills borne from



**Figure 2. Mudflats between South Killingholme and Immingham which support the majority of the internationally important black-tailed godwit population on the Humber. The extent of the mudflats in comparison to the overall extent of mudflats on the estuary may seem small, but the fact that the black-tailed godwits are largely confined to this section illustrates localised difference in biological importance that may not be replaceable. Photo: Roger Morris**

experience is often low but such skills have a considerable bearing on the organisation's reputation both locally and nationally. Higher salary grades almost invariably involve a departure from casework into other disciplines that require diplomatic skills but do not place staff under such constant pressure to make informed judgements. There is therefore a strong case for placing much greater value on those staff who provide advice on the impact of developments on Natura 2000 sites.

## Defining The Impact

Where a development proposal extends over a linear feature for several hundreds of metres or kilometres, even a relatively small incursion will rapidly amount to a substantial loss of extent. Of course, that extent is at the margin of the site and consequently it may not be the highest quality, but incursion means that the highest value core is now closer to the edge. So, although the upper foreshore may be rubble-strewn it is still fundamental to site integrity. The presence of a scrubby margin between a road and a grazing march SPA is arguably closely analogous to extension of a sea wall into an estuarine environment.

Thus, two approaches in assessment may collide. On the one hand, the consultants may conclude using EIA techniques that:

- the edge of the site is the least important and the extent of the impact is small;
- fewer birds use the edge of the site;
- there is least homogeneity at the margin; and
- therefore there will be insufficient biological impact upon the interest features that underpin the designation to warrant concern.

Conversely, the statutory conservation agency might equally conclude:

- there has been a loss of extent;
- the boundary has been moved closer to the core;
- there is increased potential for boundary effects to impact upon core interest features; and
- it is not possible to ascertain no adverse affect on site integrity.

Depending upon the legislation and impact assessment process used, it is equally possible for there to be a conclusion that the risks of a deleterious impact are small and can be discounted as a matter of concern (EIA); or the conclusion that the conservation objectives would be compromised and consequently further tests should be applied. In the end, the conservation agency should be deemed to be correct because it has applied the correct legislation in the manner it has been constructed and according to well-established case law. It might feel perverse, but the crucial point is that there is a legal process and if it is not properly followed it may be overturned by judicial review.

It is important to remember that the competent authority makes the final decision and they are within their rights to dismiss the advice of the statutory conservation agency. Should they do so, they must be capable of explaining their justification and must be prepared for judicial review. Such reviews are not necessarily called by the statutory conservation agency. Several NGOs such as The Wildlife Trusts or the RSPB might do so, and recent evidence suggests that local interest groups whose concerns relate to issues other than nature conservation will challenge procedures and decisions. In such situations, the crucial test for the competent authority is whether they are satisfied that they can say with **absolute certainty** that there will not be an adverse affect on site integrity. An expanding list of case law that tightens this decision-making is the likely result of challenges by judicial review.

## Relevant Experience

There have been numerous occasions when disagreement between the conservation agencies and developers has arisen because these two separate languages have been used. Comparatively few consultants can draw upon reliable home-grown expertise in the Habitats Directive and in my experience there is also a small cohort who seek to impose an alternative interpretation of the Habitats Directive. These judgements are generally not based on case law, whereas there is extensive case law supporting the judgements of the statutory nature conservation agencies.

The principle expertise in many consultancies primarily arises from preparation of environmental statements. These statements use definitions of scales of significance that are related to traditional 'balancing' processes. Such interpretations are irrelevant in the context of the Habitats Directive and can lead to delays and lost commercial opportunities.

Conservation agencies, on the other hand, predominantly employ people whose job is to make sure that the Habitats Directive has been applied correctly. They do not understand the use of 'significance' in the context of EIA but recognise the term in its Habitats Directive context and judgements using EIA significance automatically alarms them. They will interpret the term insignificant as dismissal of the fundamental principles of the precautionary principle that underpins the Habitats Directive.

The most prominent case in which these principles were debated was probably Dibden Bay. It has now gone down in folklore as the example of the Habitats Directive stopping a legitimate and essential commercial project. However, there were several elements of the case that made it impossible to grant consent. Debates about the relative worth of particular areas of mudflat and of 'restored' mudflat called for a scientific assessment that could never lead to a judgement that 'it can be ascertained that there will not be an adverse affect'. Without this central tenet of the developer case it was not possible to confidently conclude that offsetting measures would maintain overall site integrity, or that the requirements of the conservation objectives would be met. Consequently there was



**Figure 3. South Killingholme (Humber Estuary) where foreshore lowering is exposing the toes of the sea wall as a consequence of coastal squeeze. Movement of the sea walls into the estuary will exacerbate the problem, leading to further foreshore lowering as well as loss of a footprint within the designated site. Note the extension of the green foreshore where the mudflats about saltmarsh and the wave climate is buffered by energy absorbing saltmarsh. Photo: Roger Morris**

an inadequate package of measures and therefore even if the case for an absence of alternatives and for imperative reasons of over-riding public interest could be made, consent could not have been granted.

## The Crucial Lesson

This short analysis emphasises one single key point. The audit process established by the Habitats Directive differs profoundly from the established EIA processes. There will always be disagreement between consultants and the conservation agencies as long as consultants, perhaps under pressure from their clients, try to impose EIA processes onto the tests of the Habitats Directive. Getting inside the mindset required to administer the Habitats Directive is essential if consultants and conservation agencies are to communicate effectively. It is also essential to start from the principle that Appropriate Assessment is designed as an audit trail that records the rationale for all decisions in favour or against a particular proposal.

## References

Morris R (2008) Understanding the Habitats Directive: Appropriate Assessment - What is it and what is 'appropriate'? *In Practice* **62**: 21-23.

## Notes

1. The marine environment differs from land in the provision of advice formerly under Regulation 33 of the 1994 Regulations (35 in the 2010 Regulations).
2. Judgement of the Court (07/09/2004) Case C-127/02 Landelijke Vereniging tot Behoud van de Waddenzee and Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij

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# The South Humber Gateway –

## The Challenge of Strategic Mitigation

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**T**he South Humber Gateway is the largest allocated site for development in northern England with the potential to create up to 10,000 new jobs. It also directly adjoins the Humber Estuary and represents a major potential impact on the birds that use this internationally important wetland. In this article we highlight existing mitigation on the Humber and report on attempts to take a strategic approach to balance development and nature conservation. The important role that ecological surveys have played is also outlined.

### The Humber Estuary

The Humber, which drains approximately 20% of the land area of England, is the largest macro-tidal estuary on the British North Sea coast. A characteristic feature of the Humber is the high volume of suspended sediment which gives the estuary its turbid appearance and underpins the rich food chains of the intertidal mudflats.

The estuary is designated as a Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site and Site of Special Scientific Interest (SSSI) due to its outstanding importance for nature conservation. Habitats include major areas of intertidal mudflats and sandflats, saltmarshes, sand dune complexes, and adjoining freshwater reedbeds and saline lagoons. The arable farmland bordering the estuary – which comprises the majority of the South Humber Gateway – provides important high tide roosts for waders. The Humber is within the top five British estuaries for birds with a five year winter mean of 187,617 birds.

### Drivers for Mitigation on the Humber

A complex array of interacting factors is driving the need for strategic-level mitigation around the Humber Estuary,



**Figure 1. Tidal waters flood former arable farmland at the 440 ha Alkborough managed realignment site in North Lincolnshire**

**Photo: Graham Catley, Nyctea Ltd**

which takes place against a backdrop of extensive loss of intertidal habitat (estimated at over 6,500 ha since the 17th century). Although statutory protection has effectively ended the trend of large-scale reclamation, additional habitats are predicted to be lost through the process of ‘coastal squeeze’ whereby the natural landward ingress of intertidal habitat in response to sea level rise is prevented by the existing flood defences.

The majority of the flood defences need continued reinstatement to protect communities around the Humber. However, given predictions of sea level rise of 6 mm/yr this creates a potential conflict with the requirements of the Habitat Regulations by indirectly causing

the loss of SAC/SPA habitat. The solution outlined in the Environment Agency’s *Humber Flood Risk Management Strategy* was to identify nine sites totalling 1,900 ha which had potential for managed realignment to compensate for future loss of intertidal habitat elsewhere on the estuary.

Since the first breach was created in the sea wall at Paull Holme Strays in 2003, a further three sites have been established including one the largest examples of managed retreat in Europe at Alkborough. As well as providing compensation for indirect habitat loss through maintenance of flood defences the identified sites can also be used to offset direct habitat loss resulting from development. Both

**Table 1. Summary of the drivers of mitigation on the Humber**

Driver	Component	Consequence
Environmental	Sea level rise	Predicted to cause loss of SPA/SAC intertidal habitat
Economic	Port expansion	Direct loss of SPA/SAC intertidal habitat
	Development of estuary hinterland (e.g. SHG)	Loss of bird roosting and feeding areas
Policy	Humber Estuary Shoreline Management Plan	Identifies sites for mitigation and managed realignment.
	Habitats Regulations	Statutory protection of SAC/SPA habitat and need for Appropriate Assessment.

Chowder Ness and Welwick Foreshore, the other managed realignment schemes on the Humber, were created as compensation habitat by Associated British Ports in 2006.

In addition to the loss of intertidal habitat, there are increasing pressures on the estuary hinterland from development. The fields bordering the Humber are of vital importance as high tide roosts for waders which feed on the adjacent intertidal mudflats. Historically the Humber has had an abundance of open land fringing the estuary. However, the availability of habitat is under threat both from piecemeal developments and large-scale proposals such as the South Humber Gateway. Progressive loss of roosting sites has the potential to affect the integrity of the SPA and its ability to support internationally important bird populations.

## The South Humber Gateway

The South Humber Gateway (SHG) is located on the south bank of the Humber estuary. It stretches from the northern outskirts of Grimsby in the south to East Halton Skitter in the north and straddles the boundaries of North Lincolnshire and North East Lincolnshire councils. This approximately 1,000 ha area of mainly arable land is allocated for 'Port Related Development' in the Local Plans for both North and North East Lincolnshire.

The land is currently attracting significant development interest and considerable levels of investment. Major investments underway or planned are estimated to be worth almost £2 billion. The SHG already provides approximately 27% of the UK's oil refining capacity and is home to the UK's

busiest ports complex. Together with its sister Port of Grimsby, Immingham is the UK's largest port by tonnage. There is also a growing interest in the area from the renewable energy sector including biofuel developments and developments related to wind energy.

At the same time, large numbers of wintering and migratory birds rely upon areas of land within the SHG for roosting, loafing and foraging especially at high tide. The main wading bird species using the SHG in large numbers are golden plover, lapwing and curlew. These areas are therefore of functional importance to the conservation of the SPA/Ramsar bird populations. Prior to 2007, there were significant gaps in the data relating to the ecology of the area, particularly relating to bird usage, and hence development proposals could not be easily screened to assess any likely impacts. This inevitably resulted in delays whilst new survey work was carried out.

## The Role of Ecological Surveys

Since 2006, Humber INCA has been co-ordinating a programme of ecological surveys in and around the SHG funded by North Lincolnshire Council, North East Lincolnshire Council, Yorkshire Forward, the Environment Agency and the RSPB.

The bulk of the survey work has been a series of ongoing wintering and migratory bird surveys which have been carried out across the SHG on a weekly basis since January 2007. Breeding bird surveys have also been carried out, as well as habitat surveys (by Aerial Photograph Interpretation) and surveys for protected species such as water

vole. The data resulting from these surveys is being managed and made available to developers, policy-makers and decision-makers through the Humber Environmental Data Centre. This data now forms one of the largest ecological data sets available for the Humber and is used by developers and decision-makers alike to inform discussions relating to new developments in the area. The strategic nature of the surveys also gives confidence to decision-makers where 'in combination assessments' required by the Habitats Regulations are being carried out as the data are all from a single quality controlled data set.

In addition to the data's use for individual planning applications, following changes to the Habitats Regulations in 2006, Local Authorities are required to undertake Habitats Regulations Assessments on their Local Development Frameworks (LDFs) and their associated land-use allocations. This means that unless a local authority is in possession of accurate strategic level data when allocating an area for development, a legal challenge can be brought against that allocation which may result in a judgement that the area cannot be allocated. The strategic nature of the surveys that have been carried out allows the data to be used as part of the evidence base which informs the required Habitats Regulations Assessment.

## Ecological Impact of Proposals

The SHG development poses a number of potential ecological impacts on SPA birds using the fields adjacent to the estuary for roosting and feeding. These range from direct loss and fragmentation of habitat to increased disturbance which may result in displacement or abandonment of habitat.

Perhaps more difficult to avoid however are large-scale impacts such as direct loss of a specific habitat type important to an area's wildlife. This is the case on the Humber where the estuary's wildlife, particularly its bird interest relies on the availability of large areas of open land adjacent to the estuary on which birds can roost and feed at high tide. The 'direct loss' of roosting habitat to development is often extremely difficult to mitigate for at the individual development level. In the past this has led to up to 50% of a prospective development site being 'set aside' as roosting habitat rather than being developed on.

The above approach to the provision of mitigation has drawbacks from both ecological and the developmental points of view. From a developmental point of view, valuable development land is 'lost'. However, from an ecological point of view, if this approach was to continue, with



**Figure 2. Aerial looking northwest across the Killingholme oil refineries towards the SHG area**  
**Photo: North Lincolnshire Council**





**Figure 3. Black-tailed godwits at Killingholme Haven Pits SSSI. This important high tide roost would be enclosed by development under the SHG proposals raising the issue of whether birds and industry can co-exist as neighbours. Photo: Graham Catley, Nyctea Ltd**

each individual developer setting aside an area of their site to be managed as roosting habitat, it is possible that the wider ecological function of the area could be affected. Roosting waders require large expanses of open land upon which to rest at high tide. The open nature of preferred sites provides the birds with a sense of security in that any potential predators approaching can be detected. The very nature of developments in the SHG, which generally include tall buildings and security fencing, can create a sense of enclosure which some species of waders, particularly lapwing and golden plover, will often tend to avoid.

## Mitigation Options

Much discussion has taken place on the Humber in the past few years about the best way to ensure that the economic development potential of the SHG is maximised, whilst at the same time ensuring that the SPA wading bird populations are not negatively affected. The 'business as usual' model with each development providing its own mitigation on site was discounted at a relatively early stage. It was felt that this piecemeal approach represented a risk to both development and wildlife interests and, in addition, that best use was not being made of available resources, either land or financial.

It has been determined that the most effective course of action in the SHG is to allocate in the LDFs large areas of land which can be used to mitigate against the loss of land currently by waders for foraging and roosting. In order to deliver strategic mitigation, a SHG Ecology Group was formed comprising local authorities, landowners and both statutory and non-statutory conservation bodies. It is tasked

with producing a SHG Delivery Plan.

Within the Ecology Group, work is currently underway to identify the actual area of land required by wintering and migratory birds in the SHG and from this a series of sites will be identified which can then be managed to appropriately meet those birds' requirements. A particular challenge lies in the fact that much of the land in the area already has development aspirations attached to it.

Based on the initial analysis of the data and discussions with various stakeholders in the area, an approach centred around a series of sites which have become known as 'stepping stones' across the SHG and land adjacent to it has been adopted. These sites will need to be large enough to accommodate the birds' preference for roosting areas with long clear sight lines. The management of the sites will also need to be tailored to the birds' requirements for short vegetation swards, with wet grassland being considered as optimal habitat.

The actual mechanism for delivery of these sites is the subject of ongoing discussions. Questions remain about how the management of the sites will be secured and funded. It may be possible to make payments to existing landowners to manage their land appropriately, or the land may need to be purchased. Further work is also needed to identify how a developer's mitigation requirements will be calculated and how they can participate in the planned approach.

There is still some way to go before a final way forward is agreed. If successful however, the SHG Delivery Plan will provide the necessary framework to fulfil one of the more complex nature conservation requirements of the Humber

Estuary SPA and Ramsar site, specifically addressing mitigation needs arising from direct land take from development within the South Humber Bank Employment Allocation.

The Delivery Plan will create clarity and confidence that the impact of direct land take from within the SHG can be mitigated both inside and outside the SHG. Such an approach will enable the emerging LDFs to allocate this area for future estuary-related activity and identify a clear framework for potential investors. Of particular value is that the Delivery Plan will work towards a strategic approach across the two unitary authorities, in place of an *ad hoc* site-by-site approach to mitigation which is better for both developers and for conservation.

## Conclusion

The task of the SHG Ecology Group is to produce a coherent strategy for identifying, securing and managing sites for roosting waders and other wildlife. A comprehensive baseline of ecological data, specifically gathered for the project, will be invaluable in forming an evidence base to support future decision-making and environmental assessment.

The strategic approach to mitigation adopted by the SHG offers the greater promise of delivering larger and better functioning areas of habitat; however uncertainties remain as to how the sites will be funded and secured. The SHG would be ideally suited to a habitat bank approach in which land is purchased using development funds received through Section 106 agreements. This raises issues of how the division of financial contributions would be calculated between developers (e.g. spatial size, capital cost, potential ecological impact).

Regardless of how funds are derived, support from the landowners and tenant farmers within the SHG will be crucial to the success of the project. Options for securing land include negotiating voluntary agreements with farmers (perhaps supported by subsidies such as Higher Level Stewardship) or less favourably using powers of compulsory purchase. Once secured, sites would need to be managed in perpetuity to ensure that they continue to function as roosting wader habitat.

## Notes

1. Humber INCA is the 'Humber Industry Nature Conservation Association'. To find out more please visit: [www.humberinca.co.uk](http://www.humberinca.co.uk)

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# Are Dormice Out of the Woods?

Ian White

People's Trust for Endangered Species (PTES)

**D**ormouse conservation has produced some very positive results over the past 20 years and declines in the national population have slowed. But it is important that we both maintain and increase the momentum. The key to helping us to achieve this is knowing where they are and how they are doing and so the submission of records from both new and existing sites continues to be crucial. These data enable us to see if the measures we are putting in place to help dormice – be it coppicing, hedge-laying or mitigation in the form of creating new habitat – are working. By increasing our knowledge we can ensure that the creation of future opportunities can build on past successes.

The Great Nut Hunts of 1993 and 2001 demonstrated that dormice had been lost from seven counties in the preceding century. Their status in counties in which they remained had not been recorded since Victorian times and hence the population change over a hundred years in southern England and Wales could not be properly

understood. It is possible that in more wooded areas the dormouse population remained stable but it is likely that with less woodland management, changes in hedgerow management and increased urban development, the national dormouse population was in decline. When the National Dormouse Monitoring Programme (NDMP) was established in 1988 early results suggested that this was the case and that dormouse populations were suffering. This led to the creation of the dormouse Biodiversity Action Plan (BAP) in 1997 which had the aims of maintaining, enhancing and re-establishing dormouse populations.

## Maintaining Dormouse Numbers

Progress has been made on all three of these aims. The NDMP is the surveillance tool set up to monitor the national dormouse population trend. It is the largest small mammal monitoring programme in the world and involves approximately 600 volunteers checking nest boxes at over 250 sites. The data is submitted annually online to the People's Trust for Endangered Species (PTES), who manage the programme. Analysis undertaken in 2009 suggested that while the dormouse population decline had not been arrested in the previous 21 years, it had slowed. This was good news

and while it would be nice to attribute the improvement to two decades of conservation effort, the influencing factors are as yet unknown. PTES also manages the National Dormouse Database (NDD) which is the national dataset of dormouse records in England and Wales. Records are submitted online or by telephone by the general public, dormouse volunteers and ecological consultants; the degree of validation depends on recorder experience but members of the public are always contacted and questioned or asked to submit a photograph. Data is exchanged with Local Record Centres to ensure that the NDD is the most accurate and comprehensive national dormouse dataset. It is very important to ensure that all dormouse records are submitted to PTES to maintain its accuracy, and updated advice on the Natural England and Countryside Council for Wales licence return form encourages all holders to submit their data to PTES.

## Are Dormouse Populations Being Enhanced?

There has been a recent upsurge of interest in dormouse conservation and an increase in the number of sites submitting data to the NDMP. There has also been an increase in the number of new local dormouse



Dormouse in nest box

Photo: Clare Pengelly



groups. If more people are looking for dormice it is likely that more dormouse populations will be found but this does not mean that dormouse populations have been enhanced. More people involved in dormouse conservation however, also means that there are more volunteers prepared to undertake habitat management and more people aware of poor management practise. There was a recent situation in Kent where a contractor, working for a power company, cleared an area underneath power lines within a known dormouse site. The inappropriate management was quickly identified and after negotiation with the company, the situation was rectified to the satisfaction of all parties.

## Re-Establishing Dormouse Populations

The final element of implementing the original dormouse BAP is releasing captive-bred populations back into those seven counties where the animals became extinct, and bolstering numbers in counties where only a few natural sites are known. PTES, along with many other partners, has successfully reintroduced dormice into 10 counties and at five sites they are known to have dispersed beyond the original release wood. Although the dormouse release programme was initiated 18 years ago it is still too early to suggest that they are securely re-established within any of the counties in which they had become extinct (Mitchell-Jones and White 2009). Further, strategic, reintroductions close to existing sites could enable the formation of dormouse metapopulations which would consolidate their re-establishment within an area.

Dormice are protected under UK legislation and under European law. The wording of The Conservation of Habitats and Species Regulations 2010 implies that if the presence of dormice is identified in an area, no further work there should be undertaken. In reality, appropriate management work is usually required to ensure suitable areas of habitat are maintained for dormice in the long-term – hence many of us find ourselves in a slightly odd situation where following regulations to the letter may well result in much greater damage to an endangered species. One of the positive aspects of this legislation is that ignorance of dormouse presence is not a defence for inappropriate management, which removes any necessity for landowners to be secretive about dormice being on their land. We can use this to our benefit by using these records to further improve the accuracy of the NDD.



**Dormouse**

**Photo: Ryan Mellor**

While there is much we do know about dormouse ecology there are still large gaps in our knowledge. There is empirical and anecdotal evidence of dormice coming to ground and crossing roads and paths but there is also evidence of them going out of their way to cross tracks using branch and twig linkage (Bright and Morris 1991). Dormouse physiology suggests a predominantly arboreal lifestyle and a number of dormouse bridges have been erected recently as part of development mitigation schemes. Although the design of these bridges has been based on experiments with captive animals, they have yet to be shown to work in the wild. This should not preclude their continued use but it is imperative that any dormouse bridge schemes incorporate an aspect of long-term monitoring to assess their functionality.

We have come a long way since dormice were considered common in some counties and sold as pets in Surrey schoolyards. They might still be considered locally common in certain areas but their presence should be considered as a privilege rather than an expectation and it is important that populations are recorded to ensure their longevity. If you have any nest box monitoring data or one-off survey records please submit these to the NDMP or NDD respectively. This can be done simply online at [www.ptes.org/dormousemonitoring](http://www.ptes.org/dormousemonitoring) or alternatively posted to PTES, 15 Cloisters House, 8 Battersea Park Road, London, SW8 4BG.

PTES produces bi-annual copies of *The Dormouse Monitor* newsletter and also

administers a Google forum – both of these free resources have reports and articles on dormouse work and research that may be of interest to IEEM members. If you would like to subscribe to either, please e-mail [Susan.Sharafi@ptes.org](mailto:Susan.Sharafi@ptes.org).

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Do you already have a dormouse licence and would you be prepared to mentor new volunteers seeking to obtain their licence?

PTES are planning on setting up new National Dormouse Monitoring Programme (NDMP) sites that will require monitors. If you can help please e-mail [lan.White@ptes.org](mailto:lan.White@ptes.org).

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# Roman Snail: An Introduction to its Ecology and Legal Protection

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**I**n 2008, the Roman snail *Helix pomatia* was added to Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and it became an offence to intentionally kill, injure or take individuals of this species (as did possession and sale). Also known as the 'edible snail', the primary reason for its legal protection in England and Wales (and elsewhere in Europe) was an increasing trend in collection of large numbers by amateur cooks and for commercial use in restaurants. However, the legal protection this species is now afforded has implications for development projects. Distributed throughout South East England (but especially the North Downs) and through the Chilterns and Cotswolds, and occupying a broad range of habitats (where suitable soils are present), this species could occur on a wide variety of sites. This article provides an introduction to Roman snail ecology and licensing requirements, and illustrates these using a case study in Surrey – the M25 Controlled Motorways scheme.

Atkins ecologists first came across Roman snails in early 2009, when working on behalf of the Highways Agency, undertaking an Environmental Assessment as part of proposals for the installation of new gantries along a stretch of the M25 motorway in Surrey (the M25 Controlled Motorways scheme). An empty Roman snail shell was found during an extended Phase 1 habitat survey, at the base of a steep chalk section of the motorway verge between junctions 7 and 8 of the M25. On a subsequent nocturnal survey, a live individual was found in an area of long, semi-improved grassland with dense patches of bramble, close to junction 8. Atkins ecologists have also found Roman snails on another section of the M25 motorway



**Photograph 2. Roman snail habitat on M25 verge**  
Photo: Atkins Ltd

(close to junction 6), when working on a separate project for the Highways Agency. Shells were found within plantation woodland on the verge and live individuals have been spotted numerous times in the tussocky grassland situated directly behind the woodland.

As a result of these findings, and a need to resolve the issue of the presence of this legally protected species within proposed construction areas for the above scheme, further surveys have been carried out and appropriate licences sought.

## Habitat Requirements and Distribution

The Roman snail is known to inhabit open woodland, rough and tussocky grassland, hedge banks, chalk quarries and areas of scattered scrub. Photographs 1 and 2 show the areas of the M25 motorway verge where Roman snails have been found.

This species requires loose, friable soil for burying into for hibernation and also for depositing eggs. Lime-rich, free draining soil is a habitat requirement in the UK and studies have found a preference for south-facing slopes (Pollard 1975). Roman snails will not occur in sandy soil. They will also avoid grazed grassland and very open, exposed habitats.

Figure 1 shows a United Kingdom distribution map for Roman snail (Kerney 1999). The species is not native to the UK and is thought to have been introduced by the Romans. Much of its distribution in the UK is considered likely to be due to local introductions by humans. There are documented introductions elsewhere in England and also in Scotland and Ireland, and these are still shown on some distribution maps, but these introduced animals rarely survived for very long (Kerney 1999). This was presumably because soil and/or weather conditions



**Photograph 1. Roman snail habitat on M25 verge**  
Photo: Atkins Ltd





**Figure 1. Distribution map for the Roman snail, from Kerney (1999)**

were not suitable. The main hotspots for populations of Roman snails in England are along the North Downs (from Surrey to Kent), the Chilterns (especially in Hertfordshire) and throughout the Cotswolds and Mendip Hills fringes. There are also documented populations in Cambridgeshire.

## Life History

Many aspects of the Roman snail's life history and behaviour contribute to its vulnerability to over-exploitation. In particular, their tendency to aggregate in high numbers and disperse only short distances leaves them vulnerable to collection. Individual snails may spend their entire lives within an area of approximately 30 m in diameter and take two to five years to reach maturity and reproductive success may be low, with many British populations found to have a low proportion of young snails (Alexander 1994).

In England, Roman snails are typically active from May to August. The earliest and latest dates for activity in an area of the Cotswolds were 30 April and 1 September (Alexander 1994), with peaks in activity most likely in May and June (Dr Martin Willing, Conchological Society, pers. comm.).

Roman snails hibernate in the ground by digging down into loose soils, pulling vegetation and soil over the top to close the top of the entrance to their chamber. They remain in hibernation until spring.

## Identification

Adult Roman snail shells are typically larger than those of other snail species in England, measuring up to 5 cm across and displaying a pattern of brown bands (see Photograph 3). Crucially, the bands on their shell lack the zig-zag pattern found on the garden snail *Cornu aspersum* (= *Helix aspersa* - see Photograph 4). The body of the Roman snail is pale grey and measures up to 10 cm long on adults.

Empty Roman snail shells often appear very pale, and lack the brown colouration shown in Photograph 3, as do juvenile Roman snail shells (shown on the right in Photograph 5). Empty shells become 'bleached' and in this state are usually more than one year old (Dr Martin Willing, pers. comm.).

## Surveying for Roman snails

Whilst no standard published survey technique for Roman snails currently exists, it is considered that the combination of careful hand searches and one or two nocturnal torch surveys in suitable weather conditions, as described below, will allow an assessment of presence or absence of Roman snail at a site.

### Daytime Hand Searches

Two survey techniques were used by Atkins for the M25 Controlled Motorways scheme, once the presence of the species had been confirmed, following the identification of an old shell during the initial extended Phase 1 habitat surveys in 2009. Hand searches of areas of habitat to be affected were carried out. This involved searching through areas of long grass and scrub by hand, looking for Roman snails and old shells. Particular attention was paid to searching underneath logs, brash and artificial refuges present on the verge of the motorway. Some gantry locations were ruled as not suitable for the species, due to the presence of sandy soils. This hand searching technique was effective because each of the footprints for gantry construction were relatively small; the working area for each gantry footing (i.e. total vegetation clearance) was a maximum of 10 m x 15 m (150 m<sup>2</sup>).

In larger areas of habitat, attention would best be focused on log piles and areas that could provide refuge (see Photograph 6). This is best carried out during the snail's active period (May to August), after recent rainfall, especially in warm, humid conditions. Individuals will bury into the topsoil during prolonged hot/dry spells. At sites with well-established colonies, evidence of Roman snail presence can be found at any time of the year, in the form of empty shells.

The tendency for Roman snails to aggregate in high numbers and the longevity of their shells means that hand searching over relatively small areas is an effective way to search for evidence of this species.

### Torch Surveys

In areas deemed potentially suitable for Roman snails, a nocturnal survey was also carried out, in June, in order to look for active Roman snails. Ideal timing for torch surveys is late April to early June. This involved searching areas with a powerful torch at least one hour after sunset. This survey technique relies on appropriate weather conditions; it must be raining, have rained in the last 24 hours or be humid and it should also be warm.

A juvenile Roman snail was found during the torch survey for the M25 Controlled Motorways project.



**Photograph 3. Adult Roman snail**  
Photo: Martin Willing





**Photograph 4. Roman snail shell (left), garden snail shell (right)**

**Photo: Atkins Ltd**

## Legislation and Licensing

The Roman snail was added to Schedule 5 of the Wildlife and Countryside Act in April 2008. It is not a European Protected Species, although it does receive legal protection in other European countries. In the UK, it is protected in relation to Section 9(1), (2) and (5) of the Wildlife and Countryside Act only. This means that it is an offence to intentionally kill, injure or take this species. It is also an offence to possess a live or dead Roman snail (possession is only an offence if it has been illegally taken from the wild) and it is also protected against sale. It is not an offence to disturb Roman snail or to damage or destroy breeding places or resting places of this species. However, although disturbance is not an offence, a licence is needed to handle Roman snails, however briefly, because it is protected against 'taking'. This has implications for consultants carrying out surveys for this species. It is necessary to obtain a licence from Natural England for the purposes of science and education to allow you to pick up and examine Roman snails.

Furthermore, where Roman snails occur within areas that are to be affected by development proposals, such that there is a need to move them to avoid killing or injuring of individuals, any intentional movement of Roman snails must be licensed or should be covered by a relevant defence in the legislation, because moving Roman snails, even short distances, constitutes 'taking'.

Licences can only be issued for specific purposes under the Wildlife and Countryside Act. There is no licensing purpose for development works. However, Natural England will consider issuing a licence for conservation purposes in certain circumstances. Any conservation licence application for Roman snails will need to demonstrate that the work proposed is essential and the impacts to the species cannot be avoided in any way. It would also need to demonstrate that the work will have some conservation benefit for the species. There is no standard methodology currently available for dealing with Roman snails and each licence application will be considered by Natural England on a case-by-case basis. The licence application for the M25 Controlled Motorways scheme is presented below as a case study example, to highlight the main issues for consideration.

### Case Study: Licence Application for the M25 Controlled Motorways Scheme

A licence application for this scheme was made to Natural England in August 2010 and included information on four key areas, summarised below.

#### 1. Background to the project and details of why the work needed to go ahead

This included details about the scheme and how it would deliver safety improvements to the relevant section of the M25 motorway. Background to the Roman snail surveys and the habitats to be affected were provided. Across the 18 new gantry locations, vegetation clearance equalled 0.27 ha with a permanent habitat loss of 0.11 ha.

#### 2. Details of the population i.e. locations and numbers involved, and context in the wider area

The locations for each of the new gantries were provided, along with a brief description of habitat within each area. The results of the Roman snail surveys were set out. The location of this scheme, close to the North Downs (a hotspot for Roman snail in England), and within an area of well-connected habitat (the motorway verge) meant that populations were likely to be more robust than smaller populations elsewhere.

#### 3. Setting out the conservation aims and how these will be achieved

The conservation aim of the proposal in the licence application was to ensure the future longevity of the population of Roman snails in the area and help to maintain the conservation status of this species in the local area. Five new log piles would be created in areas outside of the gantry locations, in areas of habitat suitable for Roman snails to provide an enhancement to these species. Locations would be targeted at areas where woody cover is sparse. Log piles would be made from trees cut down as part of the gantry clearance and would be created under supervision by the ecologist.

Areas of vegetation clearance would be hand searched for Roman snails and any individuals found would be moved to the surrounding suitable habitat (not more than 20-30 m from where they were found). This would take place outside of the hibernation period.

Fencing would be erected around each of the works areas at each new gantry location. This fencing would be designed to deter Roman snails from re-entering areas prior to works commencing. Fencing would be 13 mm diameter chicken wire netting with metal stakes used at the corners for support. This sized mesh is small enough to prevent Roman snails getting through, due to the size of their shells, whilst containing holes large enough to discourage movement of snails up the fence. The fence would be buried in the ground to a depth of approximately



**Photograph 5. Adult Roman snail shell (left), juvenile Roman snail (right)**

**Photo: Atkins Ltd**

30 cm to prevent snails burrowing beneath. The top of the wire netting would be folded outward to create a 'lip' on the outside to further deter snails from entering. The fences would be 1 m high.

#### 4. Monitoring

One monitoring survey for Roman snails would take place in the year following completion of the works. This would take place within habitats around all of the new gantries and also immediately adjacent to the new gantries. The results of the survey would be assessed to ensure that the existing distribution of Roman snail within the local area has been maintained and would be used to inform further mitigation, if appropriate.

Results of the monitoring survey would be passed to the Conchological Society national non-marine recording scheme and the local biodiversity records centre.

Delivering habitat enhancements for Roman snails will depend on the conditions at the site, but as well as creating log piles, could also be achieved by creating or introducing a base-rich, friable topsoil. In more open areas, creating more cover, through planting of scattered scrub, or relaxation of management regimes could deliver enhancements. Woodland edge could be improved through the creation of ecotone habitat, where this does not already exist.

The above application was granted by Natural England. However, subsequently, a decision was taken by the Highways Agency not to build new gantries in this part of the M25 Controlled Motorways scheme and therefore, this licence will not now be implemented.

## Summary

The Roman snail is a relatively easy species to identify, once familiar with its characteristics. Identifying the potential presence of the species can be achieved through understanding of its habitat requirements and will be aided by the fact that, broadly, its distribution is quite well understood and likely to be relatively unchanging in England, due to its inability to colonise

new areas quickly. However, increased surveying and reporting for the species, now it is legally protected, could lead to amendments to the distribution map, and it would no doubt be beneficial to send records to local biological record centres and to the Conchological Society of Great Britain and Ireland.

Dealing with Roman snails on development sites is relatively new and mitigation and habitat enhancement measures are currently largely untested. Collation of information from future projects will enable ecologists and stakeholders to refine techniques and test new approaches. As with habitat enhancements for other species, measures to improve habitats for Roman snails are likely to lead to benefits for other species in the local area.

## Acknowledgements

Heather Mansfield works for Atkins based in their Cambridge office. The views expressed in this article are her personal views. The assistance of colleagues John Box CEnv FIEEM and Jules Wynn MIEEM is gratefully acknowledged. Constructive comments from Martin Willing, Conservation Officer of the Conchological Society on a draft of this paper are gratefully acknowledged, as is assistance with field study techniques and habitat recognition on the M25 project.

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Photograph 6. Hand searching for Roman snails

Photo: Atkins Ltd



# Member's Comment: Spending Cuts

Martyn Kelly CEnv FIEEM  
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**About 10 years ago I spent two dispiriting years as a governor of the junior school in my village. I learnt many things during those two years. I learned how hard teachers worked and how dedicated most of them are. I learned how much importance is placed on the Key Stage 2 SATS results and how much effort is dedicated to preparing year six pupils for these tests. I also learned that getting good SATS results is not just about the quality of the teaching but also reflects the catchment, and that there is a small, but crucial, component in the results which, for want of a better term, is down to 'gamesmanship'. Having put so much effort into preparing the pupils for the test, it would be foolish not to get conditions in the school just right before the test. In my school this included feeding all the children a good breakfast ahead of the tests (which was fine, by my book) but it also involved a lot of coaching of 'borderline' students in order to tip them across into the grades expected of 11 year olds. This was not so good, in my eyes, as it was at the expense of effort spent on the rest of the class. The head teacher and several of my fellow governors disagreed with me: the more children who attained the grade, the better the school's performance in the league tables and the more likely we were to attract parents who cared about their children's education.**

I could go on. The experience was an unpleasant insight into the extent to which public sector managers could manipulate and control information in order to present their unit (in this case, a junior school) in the best possible light. There were a variety of motives

behind this: the benign explanation was that the head teacher created a positive atmosphere around the school which, in turn, supported her teachers at the chalkface. The alternative viewpoint was that, in a target-driven culture (which extended to the head's own performance-related pay), this 'gamesmanship' provided scope for a mediocre but ambitious individual to compete with the genuinely capable.

What has this got to do with environmental management? Many of us are involved with the public sector, if not as employees then as contractors and consultants. And the scenario that I have described above is repeated in different guises across all departments of central and local government. We are engaged, simultaneously, in delivering the service we are employed or contracted to supply and in fulfilling some broader corporate objective of presenting the organisation in the best possible light in an unfavourable economic climate. Fail in the latter and you may make the former even more difficult as the economic noose tightens.

But here's the rub: if you went around the village to canvas opinions about my local junior school you would find a spectrum of opinions. Some parents were happy with the school, many were indifferent and others were unhappy. In my case, I joined the diaspora and moved my children from a school less than 100 m from my house to schools in neighbouring villages. My point is that we were able to test the school's propaganda against our own experiences and weigh up the pros and cons. Even if we did not have children at the school, we had neighbours and friends who did, and we could canvas their opinions and make up our own minds.

The same applies to other so-called 'frontline services'; we have opportunities to test government or opposition propaganda directly against our own experiences. It is the very essence of a functioning democracy. But we are environmental managers and, as such, often one or two steps removed from the direct cause-effect relationship we have as customers of the health and education services. My own area

of interest is freshwater ecology and I worry that recent legislation has pushed the debate beyond the point where most of the public can be actively engaged. Few rivers that are now so grossly polluted that someone walking a dog will notice and the debate, increasingly, is about the balance of organisms, the risk of occasional night-time anoxia or the capacity of salmonids to spawn. People's perceptions are gained as much from the article in the local paper saying that otters have been sighted or in a national paper saying that water quality is better than it was 20 years ago, as it is from direct experience.

Over the past eight years I've used my alter-ego, Basil O'Saurus, to poke gentle fun at the absurdities of our profession, and the public sector has often been on the receiving end of this. I trust the integrity of all the public sector scientists I know but I do worry that big organisations are not just the sum of their parts; the corporate function of public bodies sees importance in creating the perception of service delivery alongside the reality. As the cuts start to bite I worry that we will cross a tipping point, when our ability to manage and regulate will be seriously undermined. My concern is that a bullish, can-do mentality in middle and upper management, desperate to maintain the illusion of efficient service delivery and filtered through efficient PR departments, will obfuscate the true extent of the crisis. Basil O'Saurus may try to put a smile on your face by telling you *How To Look Good Knackered* but, really, this is not a joking matter.

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# Rebuilding Biodiversity

**IEEM Autumn Conference, 2-3 November 2011, Liverpool**



This conference aims to inform delegates of the strategic and practical approaches to conserving and rebuilding biodiversity in the UK.

The conference will open by painting the 'European picture'; then go on to examine some of the current biodiversity conservation tools available (including the planning system, biodiversity offsetting, and the Common Agricultural Policy); look at the evidence base for priority actions (biodiversity auditing as well as some recent climate change research); and finish by looking at some practical case studies (small and large scale) in the terrestrial and aquatic sectors.

Further information and a full conference programme will be added to the website shortly and all IEEM members will be informed when the booking period is open (late June 2011).



[www.ieem.net/conferences.asp](http://www.ieem.net/conferences.asp)

Photos (clockwise from top left): Andy Karran, Nick Jackson, Scottish Natural Heritage, Claire Hopkins, Nick Jackson, Andy Karran, Cris Barron, Mott MacDonald, Pete Johnstone, Alan Bell, Martha Tressler, Southern Water

# IEEM Spring Conference 2011: Invasive Species

Nick Jackson AIEEM  
Education and Professional Development Officer, IEEM

**IEEM's spring conference took place on 23 March 2011 in London and attracted 200 delegates. The aim of the conference was to provide delegates with a better understanding of invasive species, the damage they can cause and solutions to their management and eradication. Speakers presented the European picture before talking about the situation in the UK, highlighting practical case studies including the use of new biological and chemical control techniques.**

IEEM were very pleased to welcome **Professor Myrium Dumortier**, who works at the European Commission, developing an EU-strategy on invasive alien species, to be published in 2012. Myrium explained how working groups composed of Member States, stakeholders and experts, have been established to prepare an EU instrument, and consider all possible components and options for the strategy. The resulting reports will then be fed into the impact assessment to be elaborated by the Commission in order to explore different policy options and finally choose the most appropriate instruments.

The next speaker was **Olaf Booy** from the GB Non-Native Species Secretariat (NNSS) who explained the UK strategy on invasive species. The Strategy was among the first in Europe to provide a comprehensive national policy framework on invasive non-native species. It sets out a high-level framework and details the key actions required to address the problems caused by invasive non-native species. Olaf's presentation provided the background to the establishment of the NNSS and GB Strategy and provided examples of the work that has been undertaken as a result.

**Dr Helen Roy**, a research scientist from the Centre for Ecology and Hydrology, spoke next about a partnership project which she has been involved with called Recording Invasive Species Counts (RISC). This scheme was developed to increase participation in recording invasive non-native species and to encourage greater understanding of them. Sightings, including

photographs, of 14 non-native species can be uploaded to an on-line system ([www.nonnativespecies.org/recording](http://www.nonnativespecies.org/recording)) which is a component of the GB Non-Native Species Information Portal. It comprises a database of 3,792 non-native species, together with basic information about their origin, ecology and impact. This is then in turn linked to distributional data held on the National Biodiversity Network. RISC has served as a prototype for developing rapid-reaction capability, whereby particularly harmful new arrivals can be immediately notified to the relevant bodies. (See pages 16-17 for more on RISC.)

The next speaker, **Sean Hathaway MIEEM** from the City and County of Swansea, gave a presentation about invasive issues faced by local authorities (mainly Japanese knotweed in Swansea - approximately 100 ha at the last count!). Sean gave a brief overview of what the council has done/doing about Japanese knotweed, followed by how it is getting to grips with other invasive non-native species, of which there are thankfully relatively few in the Swansea area. Sean's presentation covered legislation, training, treatment, landscaping, funding and policies.

**Professor Max Wade CEnv FIEEM**, a principal ecologist with RPS, finished off the morning session with a presentation about the ecological consultant and invasive species. Max highlighted the greater role for consultants as they have an already well-established (and growing) expertise in this area. He explained to delegates that over 50% of the invasive species work done by RPS in the last year involved Japanese knotweed and over two thirds of work took place in an urban environment. This highlighted how there is currently a serious imbalance in effort (and expenditure) with other invasive species control. Max also explained the problem faced by consultants concerning expectations regarding costs and complexity of the work required by developers.

**Dr Dick Shaw**, from CABI, gave the first presentation after lunch on the research on the biological control of Japanese knotweed using *Aphalara itadori*. Dick's presentation focused on the six years of research that culminated in the release of the specialist psyllid *A. itadori* in the UK in 2010. This is a first



Figure 1. Around 200 delegates attended the conference in London





**Figure 2. Speakers took to the stage to answer questions from the audience. From left to right: Sean Hathaway, Max Wade, Myrium Dumortier, Helen Roy and Olaf Booy.**

for any EU country and could only take place after extremely thorough research, a full pest risk analysis, peer review and expert and public consultation. After a limited and intensively monitored first phase release it is hoped that the benefits of this natural enemy can be felt more widely in Great Britain and eventually the rest of Europe and North America alike. There are many more appropriate weed targets in Europe and this pioneering project should lead to a wider uptake of what is a tried and tested technology.

**Mark Prout**, Associate Director at Thurlow Countryside Management (TCM), has been involved in some of the largest Japanese knotweed eradication projects ever undertaken in the UK, and gave the next presentation highlighting examples of some of this work. Various methods of treatment were discussed by way of case studies of actual treatment programs carried out on projects at the Stratford Olympic Park (Japanese knotweed and giant hogweed eradication), Dolcoath, Cornwall (Japanese knotweed eradication) along with various others. Mark considered the problems encountered from the initial site visit through to the completion of each project. (Read more about Mark's work on pages 6-8).

**Sophie Thomas**, Invasives Officer at Plantlife, gave the next presentation and spoke about Plantlife's horizon scanning for potential future invasives and their recent Invasive Plants Project. Through this project, Plantlife have undertaken control of invasive plants at some of the key botanical hotspots, as well as sought to prevent invasive non-native plants from getting into the wild in the first place.

The final three speakers provided an aquatic slant and **Simon James CEnv MIEEM**, UK Director of Ecology for Royal Haskoning, gave a presentation on the experimental trials for the control of floating pennywort on the Pevensy Levels. The research into methods for the control of floating pennywort is fragmented, with little data on baseline conditions and effects of comparative control methods on aquatic macroinvertebrates and macrophytes. The Royal Haskoning team designed an experimental programme to determine the impacts of floating pennywort on the species of conservation concern and a series of trials to assess the effectiveness of control methods and consequential impact on non-target species. This information is now being assessed for implementation at a national level by the Environment Agency and Natural England.

**Trevor Renals**, National Technical Advisor on invasive species for the Environment Agency, spoke next about Ponto-Caspian invasive species including the killer shrimp, *Dikerogammarus villosus*. The 'killer shrimp' is one of a variety of Ponto-Caspian invertebrates that are in the process of spreading across Western Europe. Its arrival in the UK was confirmed in September 2010, at Grafham Water, Cambridgeshire and has

subsequently been found at Cardiff Bay and Eglwys Nunydd, South Wales. A national biosecurity campaign will be launched on 28 March 2011 to increase public awareness with regards the importance of biosecurity. Trevor explained that preventing the further spread of *D. villosus*, and the arrival of those invasive species that have yet to arrive on our shores, presents our best current option for managing this issue. (Read more about *D. villosus* on pages 9-11.)

The last presentation of the day was from **Dr Elizabeth Cook**, from the Scottish Association for Marine Science (SAMS), who spoke about their Marine Aliens programme. The programme began in 1994 and was the first project of its kind in the UK. Funded by the Esmée Fairbairn Foundation, the programme brought together six academic research institutes who were actively participating in research on seven non-native species including: the macroalgae *Sargassum muticum*, *Undaria pinnatifida* and *Codium fragile* subsp. *fragile*; the caprellid amphipod *Caprellid mutica*; the Chinese mitten crab *Eriocheir sinensis*; and the tunicates *Styela clava* and *Perophora japonica*. The Marine Aliens team was able to share their specialist expertise and, for the first time, document the distribution of these seven target species in over 130 sites throughout the UK, in addition to studying their biology, rate of spread and ecological impact. Liz explained that their work also highlighted the presence of over 60 established non-native marine species in the British Isles. The focus of the last three years has been to determine the risk posed by hull fouling on recreational and commercial vessels, identifying high risk entry points for invasive non-native marine species and determine the most effective method for eradicating an initial introduction before establishment and secondary spread is able to occur.

The presentations from this conference will be available very shortly on the IEEM website. I would like to thank all the speakers for their time and presentations and hope that the delegates found it a useful and interesting day.

IEEM's next conference is taking place on 15 June 2011 in London, and is entitled 'Biodiversity and the Big Society'. The IEEM Annual conference is taking place in Liverpool on 2-3 November 2011 and will be on the subject of rebuilding biodiversity. Further details and conference programmes will be available on the IEEM website shortly.

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# Living With Environmental Change (LWEC) Partnership

Linda Yost CEnv MIEEM  
Deputy Chief Executive Officer, IEEM

**IEEM was invited to take part in the Living With Environmental Change (LWEC) workshop on Ecosystem challenges: To manage ecosystem services for human well-being and to protect the natural environment in a changing world. LWEC is an influential partnership of 22 public sector organisations that invest money for UK taxpayers to reach 'solutions' to urgent challenges and realise opportunities that environmental change can bring. The LWEC partners can pool resources to develop a 'whole systems' approach to research. For instance, bringing together different types of expertise to discover how to preserve the health of the insects we need to pollinate our crops, or collaborating to create the best conditions for commercial innovation in, for example, low carbon vehicles.**

The LWEC Vision is 'to optimise the coherence and effectiveness of UK environmental research funding and ensure government, business and society have the foresight, knowledge and tools to mitigate, adapt to and benefit from environmental change'.

The Strategic Challenges include:

- **Climate Challenge:** To predict the impacts of climate change and to promote sustainable solutions through mitigation and adaptation
- **Ecosystems Challenge:** To manage ecosystem services for human well-being and to protect the natural environment in a changing world
- **Resources Challenge:** To promote human well-being, alleviate poverty and minimise waste by ensuring a sustainable supply of food, water and other resources
- **Health Challenge:** To protect human, plant and animal health from diseases, pests and environmental hazards in a changing environment
- **Infrastructure Challenge:** To make infrastructure, the built environment and transport systems resilient to environmental change, less carbon intensive and more socially acceptable
- **Societal Challenge:** To understand how people respond to a changing environment and develop thriving, cohesive and informed communities

The purpose of the roadmapping workshop on Ecosystems Challenge was to: 'assess the links and feedbacks between the natural environment, ecosystem services and human well-being; how these might continue to develop within environmental limits in the face of major environmental

change; and how decision-making and local and national planning can take account of these links and feedbacks to help in the development of new social, environmental and economic opportunities.'

The outputs from this roadmapping workshop will be used as a first step to developing strategic frameworks that will identify and prioritise issues and needs for each of the LWEC strategic challenges. It is important to recognise that not all priorities will lead to the development of new research; a number of knowledge exchange activities, including reviewing current research and evidence, knowledge exchange fellowship placements, networks or communities of practice, could be suggested at implementation for potential delivery mechanisms. In addition, it is likely that some priorities will be identified that are on the periphery of LWEC remit and such delivery will involve collaboration with other initiatives such as Research Councils UK (RCUK) Priority Themes or UK Collaborative on Development Sciences (UKCDS). Furthermore, some of the issues or needs identified by the strategic frameworks may still be at sufficiently high level that direct delivery mechanisms cannot be identified. In these instances the implementation plan may recommend that further work will be needed to identify the priorities in these areas.

After all the Challenge roadmapping workshops have been considered there will be a further workshop specifically dedicated to cross-cutting issues. All the workshop outputs will be accompanied by a gap analysis of evidence mapped against needs. This, and information collated from recent reports or reviews, for example, will make up the strategic framework. Workshop participants and others will be given the opportunity to comment on draft framework documents over the summer. During autumn 2011, implementation plans will be developed for the frameworks although work on implementation will begin in priority areas before this.

What was notable from the workshop was the lack of discussion regarding a skills gap. Topic areas considered key to the ecosystems challenge are lacking (e.g. environmental economics and ecosystem services are just two of the areas identified in IEEM's Ecological Skills Project where skills and knowledge and, fundamentally, understanding are lacking).

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# Wetlands Matter:

Valuing Wetland Ecosystems in a Changing Climate, 24 February 2011

Linda Yost CEnv MIEEM  
Deputy Chief Executive Officer, IEEM

**A lone piper stood at the door to pipe in guests to Edinburgh Castle's Great Hall; a most prestigious location for the reception of the triennial members meeting of Wetlands International held on this occasion in Scotland. The reception was the forerunner to a symposium, hosted by the Scottish Government and Wetlands International and organised by the Scottish Government, Scottish Natural Heritage, Scottish Environment Protection Agency and Wetlands International.**

The evening included an address by Roseanna Cunningham SMP and the award of the third triennial Luc Hoffmann Medal For Excellence in Wetland Science and Conservation; awarded to Dr Leo Zwarts, as a representative of the team of authors and contributors to the book 'Living on the edge - wetlands and birds in a changing Sahel' and the substantive body of work that this represents - the results of almost 15 years of research and conservation activities.

The week had commenced with the Wetland International Members Meeting, where Governmental and NGO members from all over the world considered the organisations 10 year strategy; it concluded with a symposium 'Wetlands Matter: Valuing wetland ecosystems in a changing climate'. Representatives of governments, civil society and research centres from around the world gathered to discuss the values and contributions of wetland ecosystems to climate change and innovative approaches to sustainable development.

Greater attention is being given to the role of wetlands in reducing climate change impacts and emissions, as increasingly it is being understood that the loss of wetlands cause very large greenhouse gas emissions. Many wetland types also play a key role in reducing

the impacts of climate related extreme weather events like floods and droughts. Consideration was also given to the effects on wetlands themselves from climate change impacts; in particular they suffer from increasing droughts. These are all critical challenges, to which the symposium tried to find solutions.

The key message from the symposium, its Communique, begins: 'Wetland conservation, management and restoration offer essential and effective strategies for climate change mitigation and adaptation, particularly though the role of wetlands in regulating the water cycle, on which all life depends. At the same time, wetlands are themselves vulnerable to change, and increased efforts are required to conserve and restore them in all countries. Methods for assessing the full value of the services provided by wetlands are becoming better developed, and this is key to informed decision-making on these issues.'

The organising committee, amongst others, included Professor Des Thompson FIEEM (SNH) and Lorna Harris MIEEM (SEPA), and speaker Professor Chris Spray MIEEM (Dundee University). Further information is available on Wetlands International's website.

SEPA has recently developed a webpage ([www.sepa.org.uk/science\\_and\\_research/conferences\\_and\\_events/wetlands\\_symposium\\_2011.aspx](http://www.sepa.org.uk/science_and_research/conferences_and_events/wetlands_symposium_2011.aspx)) to provide general information about the event and its outcomes. The final symposium communiqué, programme and conference abstracts (updated from the version circulated at the event) are available on this site, which also includes a link to the Wetlands International website. They are also looking into the possibility of putting the presentations from the event online here.

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## Internships – A Win-Win Situation

Sally Hayns  
Chief Executive Officer, IEEM

**Have you ever thought about offering internships as part of your business or organisation's development strategy? Three, six or twelve month internships are an excellent way to introduce some new thinking and skills into your team whilst giving a recent graduate some highly valued work experience that will hopefully kick-start their career.**

We all know how tough it is out there for graduates at the moment so the opportunity to apply their recently hard-earned knowledge in a business environment whilst earning a little bit of money (yes interns are paid – they are not volunteers and should earn **at least** the minimum wage) is likely to attract high calibre applicants keen to learn and keen to deliver.

Over the past two years IEEM has employed a number of interns on six month contracts to undertake specific projects and tasks. Examples include updating our Professional Guidance Series, reviewing the Competencies for Species Survey, updating our web-based information for students and, with our current intern Jessica Batchelor, updating the Guidance on Ecological Impact Assessment. Thus we have been able to get work done that we would otherwise

have not had the capacity to do as well as getting an extra pair of hands to help with general secretariat tasks.

To get the most out of the experience, interns should be given a specific area of responsibility or project that they can help shape and develop during their time with your business. Remember that the experience is as much about getting something specific for their CV and learning some work skills as it is about helping your business or organisation get things done so do invest in their training and development. You may even find that you have unearthed the next rising star of your team.

There are lots of ecology and environmental graduates out there looking for a chance to get started in their career so do consider whether you can give one or more of them an opportunity over the coming months. We all had to start somewhere!

If you are able to offer an internship this summer or autumn you can place your advert for FREE on the IEEM website. For further details contact Nick Jackson at [nickjackson@ieem.net](mailto:nickjackson@ieem.net).

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# EcIA Guidelines

## Review and Update of the Guidelines for Ecological Impact Assessment in the United Kingdom (Terrestrial, Freshwater and Coastal)

Jessica Batchelor

Operations Assistant – Professional Affairs, IEEM

**A review of the Guidelines for Ecological Impact Assessment in the United Kingdom (Terrestrial, Freshwater and Coastal) (2006) is now underway and is due to be completed in August 2011.**

The review, rather than being a rewrite of the Guidelines, is taking into account the following:

- inclusion of the Republic of Ireland;
- feedback from practitioners on the application of the EcIA Guidelines since 2006;
- changes and revisions as a result of the publication of the Guidelines for EcIA in Britain and Ireland: Marine and Coastal in 2010;
- alignment of the coastal context of the two documents;
- any relevant changes in legislation since 2006; and
- inclusion of case studies.

Prior to the start of the review, IEEM contacted the Statutory Nature Conservation Organisations, statutory bodies and NGOs whom IEEM would like to see involved in the review process. Many of these organisations have already sent in their initial comments on the current Guidelines or committed to commenting on draft chapters as they are produced. It is hoped that these organisations will all endorse the revised Guidelines on publication. Comments were also sent in by our members volunteering as Corresponding Participants.

A Technical Review Group (TRG) was formed, consisting of John Box (Editorial Chair), Richard Arnold, Karen Colebourn, Diane Corfe, Cameron Crook, Mike Dean, Bob Edmonds, Mick Hall, Richard Knightbridge, Caroline McParland, Jo Treweek and Duncan Watson, supported by Jessica Batchelor and Linda Yost from the Secretariat. This group has conducted an initial review of the Guidelines, taking into account all comments received from organisations and members.

Feedback from members and organisations highlighted a strong demand for more case studies and examples to be included within the Guidelines and additional worked examples to be available through the IEEM website. For this reason, IEEM would like members to contribute practical examples/case studies, including information on conditions and mitigation requirements from the planners where available. Without members real life case studies we will not be able to fulfil this request from the membership.

Following the initial review, the TRG have drafted a revised set of EcIA Guidelines. There will be a six week period of consultation on this document, which aims to run from 30th May – 8th July. Members are invited to view the consultation document on the IEEM website. Please contact Jessica Batchelor by e-mail at [jessicabatchelor@ieem.net](mailto:jessicabatchelor@ieem.net) or by phone at 01962 868626, to make comments or send in practical examples/case studies.

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# Marine Protected Areas – Aspiration or Reality?

North Sea Marine Cluster Conference, Thursday 7 April 2011, London

Linda Yost CEnv MIEEM

Deputy Chief Executive Officer, IEEM

**The University of East Anglia's London study centre was the location for the North Sea Marine Cluster event 'Marine Protected Areas – Aspiration or Reality?' The conference considered the idea that we could be on the brink of the greatest positive set of changes in the way that our seas are managed. Across the broad sweep of marine management, the planned reforms are at that delicate stage between conception and implementation.**

**It would be easy to believe that much of the hard work is done: the long fought argument for reform is won, policies are in place, legislation has been passed and Commissioners and Ministers are firmly committed to the changes happening. It asked whether, despite all this, the reality turn out to be very different from the intention?**

Marine Protected Areas (MPAs) are seen as one of the most important tools for protecting the marine environment. The UK Government and the Devolved

Administrations are committed to a massive expansion of MPAs over a short period of years, a process already underway. Experience elsewhere and the hard lessons of the past suggest that disappointment could be around the corner if insufficient attention is given to the practicalities of implementation.

Those involved with Marine Protected Areas believe that there is a need to give greater consideration to how these sites should be monitored and managed if the UK is to avoid pitfalls previously experienced, here in the UK and elsewhere, and to gain from the

**Continued on bottom of next page >>**

# IEEM's Strategic Plan 2011-2015

Sally Hayns

Chief Executive Officer, IEEM

**T**here is a German proverb that roughly translates as 'What is the use of running if you are not on the right road?' Whilst there was no suggestion that IEEM is not on the right road, it is always a good idea to periodically check the map and ensure that the road that you are on is the best route to get you to your destination. And that, very simply, was the rationale for producing the Institute's new Strategic Plan that was approved by Council in March.

Those of a more technical disposition may prefer James Quinn's definition in Strategic Change: Logical Incrementalism (1978) of a Strategy being 'the pattern or plan that integrates an organization's major goals, policies, and action sequences into a cohesive whole.' Either way the outcome is the same. IEEM has a new set of planned goals, targets and actions designed to drive the organization forward over the next five years. Thank you to all those Council and Committee members, Geographic Section Committee members and staff who helped it take shape. It is a Strategy that we hope will encompass a continuing rise in our membership, the gaining of a Royal Charter, a growth in our influence on issues affecting our members and greater recognition of ecological and environmental management as a professional career. It is a Strategy that all of us – members, Council and Committee members, Geographic sections and Secretariat team – will have a hand in implementing to ensure successful outcomes. Above all it is a Strategy that will underpin the Institute's next phase of development as it moves towards its Silver Anniversary in 2016.

As part of producing the Strategic Plan we have revisited our Vision and Mission and rephrased them to better meet our aspirations (see box). We have also identified five key strategic objectives (in no order of priority):

- Improving the sharing of information, knowledge and best practice in ecological and environmental management.
- Promoting the highest standards of practice in ecological and environmental management.
- Leading in the training and skills development of the profession.
- Championing ecological and environmental management as a respected profession.
- Becoming a more powerful voice for our members in influencing nature conservation legislation, policy and practice in the UK (including devolved administrations), Ireland and Europe.

In order to achieve this we have identified three further strategic objectives:

- Significantly increasing our reach and membership in order to strengthen our profile and influence over our profession.
- Continuing to improve IEEM's financial stability and organisational effectiveness.
- Improving IEEM's own environmental performance.

For each of these strategic objectives we have identified several key performance indicators with which to measure our progress. Delivering on these key performance indicators will shape the work of IEEM's committees and Secretariat over the next few years, supported by the activities of the Geographic Sections. We envisage a greater role for Fellows in helping to take the Institute forward and hope to engage more of the wider membership in helping their professional institute to succeed.

The full Strategic Plan can be viewed in the members' area of the IEEM website and a summary version will be circulated to all members soon.

I am very pleased that Council have approved this approach and I am grateful for all their support in its development. But be assured that we all recognise that the measure of a successful Strategic Plan is how effectively it is put into action. As Winston Churchill once said: "However beautiful the strategy, you should occasionally look at the results."

## Our Vision

*A society which values the natural environment and recognises the contribution of professional ecologists and environmental managers to its conservation*

## Our Mission

*To promote the highest standards of professional practice, and to raise the profile of professional ecological and environmental management, for the benefit of nature and society.*

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## Continued from previous page >>

know-how of successful practitioners. The conference was aimed at those with a direct interest in the proposed UK network, whether as marine users, those concerned with marine conservation or policy-makers and managers.

Carla Montesi (Director, DG MARE, European Commission) spoke about the need for integration and coherence in the implementation, management and collation of marine data across Europe.

Daniel Owen (Barrister, Fenners Chambers) outlined the constraints of

international and European maritime law: 6 nm, 12 nm, 24 nm and 200 nm limits for shipping, fisheries and nature conservation being quite a minefield of national and international rights and responsibilities!

The American perspective on Managing MPAs came from Elizabeth Moore (Office of National Marine Sanctuaries US National Oceanic and Atmospheric Administration), who gave much food for thought on the value of partnership working.

Whilst Richard Benyon MP (Minister for Natural Environment and Fisheries)

spoke of the economic value of the seas some £47 billion in fisheries, tourism and coastal activities.

Professor Charles Sheppard (University of Warwick) showed the benefits of no take zones, and in doing so touched on the issues of social welfare and the exclusion of the native population from Diego Garcia.

For more information go to: [www.nsmc.eu.com/page/conference](http://www.nsmc.eu.com/page/conference)

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# Institute News

As this issue of *In Practice* arrives we are preparing for a very special highlight of the year – the presentation later this month of the IEEM Medal to a recipient who has made an outstanding contribution in their field. This year we are very pleased to be holding the reception at the House of Lords as the guest of Lord Chidgey. The recipient of the Medal is Pavan Sukhdev, Special Advisor and Head of UNEP's Green Economy Initiative. He was involved in the Green Accounting for Indian States Project (GAISP) and also the Study Leader for the G8+5 commissioned report on TEEB (The Economics of Ecosystems and Biodiversity – [www.teebweb.org](http://www.teebweb.org)). He is Chairperson of the World Economic Forum's Global Agenda Council on Biodiversity and was a speaker at Davos 2010. He is undoubtedly a very worthy recipient and we look forward to reporting on the event in the next issue of *In Practice*.

## New Fellow

At its meeting in March Council approved **Mrs Claire Wansbury** as the latest Fellow of the Institute.

Claire is a senior professional ecologist with almost 20 years experience in both the public and private sector. Claire has extensive experience in Appropriate Assessment, Environmental Impact Assessment and development projects. In addition to her work as a consultant Claire was a member of IEEM's Membership Admissions Committee for many years and was involved in the initial assessment of Chartered Environmentalist applications under the grandparenting scheme. Claire has served on the RTPI steering group on accreditation for Strategic Environmental Assessment, she was a member of the Green Building Council working group that produced 'Biodiversity and the Built Environment' and is currently on the steering group for CIRIA's project to produce a guide to the conservation and enhancement of biodiversity within civil engineering projects.

## Twenty-First Anniversary

Whilst some of our countrymen and countrywomen may be forgiven for thinking that the highlight of 2012 will be the Olympics in London, those of us in IEEM know that the real highlight will be the celebration of the Institute's 21st Anniversary.

So how can we appropriately mark this occasion without undergoing months and months of rigorous training in order to excel in the sporting arena? Council would like your ideas please, especially those that can involve and engage members as well as raising the Institute's profile.

## Naturally Professional

Communicating succinctly what an organisation is about is fundamental to effective marketing and promotion and many organisations (and businesses) commonly use a strapline in association with their name and logo – it has to be said with varying degrees of success. The British Ecological Society's 'Advancing ecology and making it count' is fairly self explanatory, as is Scottish Natural Heritage's 'All of nature for all of Scotland'. Others, such as 'mediation of space, making of place' (RTPI), are a bit more obscure. Well, colleagues within IEEM have spent many an hour in recent months trying to decide on an appropriate strapline for IEEM that doesn't include the words ecology or environmental management (as they are already in the name and logo). Finally we have a result and we are pleased to unveil our new strapline as:

*Naturally Professional*

## Ecological Skills Project

The current phase of the Ecological Skills Project is drawing to a close and we are grateful to the consultants, The Management Standards Consultancy, who have delivered this phase under the direction of Linda Yost, Deputy Chief Executive, and a Project Board comprising Max Wade (Chair), Pam Nolan (Chair of the Training, Education and Career Development Committee), Eirene Williams and Sally Hayns. We are also grateful to a number of Corresponding Participants who have commented on various drafts of the Project Report.

Council will be considering the findings of the research and the recommendations later this month and IEEM members will get a full summary in due course. However, we can at this stage report that we have clear and measurable evidence of a skills gap in our sector (and likely future skills shortages), its nature and scale. We have also identified a number of potential actions for IEEM and its partners to help address the problem.

It is impossible to overestimate the importance of this work, not only to our profession as we seek to ensure that we are able to meet the challenges of biodiversity protection and enhancement as part of sustainable economic development but also to the Institute and its members in seeking professional recognition and understanding of what it means to be a competent and capable ecologist and/or environmental manager.

## Consultations

With the support of member contributions the Institute has recently been involved in a number of consultations including:

- The Horticultural use of Peat (Defra);
- The Contribution of Natural Heritage to Better Place-making (Scottish Natural Heritage); and
- Surveying for Onshore Wind Farms (Bat Conservation Trust).

## Meetings

We have flown the flag for IEEM at a number of meetings including attendance at:

- the Natural Connections conference in London;
- the Mammal Society conference in Nottingham;
- the North Sea Marine Cluster's conference in London on Marine Protected Areas; and
- the 1st International Conference on Marine and Maritime Affairs in Plymouth.

Sally Hayns attended the annual meeting of the National Federation of Biological Recorders in Bristol in early April. One of the most exciting areas of discussion was around the use of new social media technologies to not only record biodiversity data but also to engage a new 'army' of recorders.

At the European Conference on 'Biodiversity and Climate Change – Science, Practice and Policy', which was held in Bonn in mid-April, there was an impressive line-up of speakers summarising some fascinating research on the impact of climate change on a range of habitats and species. Of particular note were Dr Carsten Nowak's work on the potential loss of genetic lineages in montane species under different climate change scenarios, Professor Michael Reich's work on modelling the predicted range shift capabilities of key species and determining whether current ecological networks



are sufficiently robust given the predicted scenarios of increasing habitat fragmentation and species isolation and a paper from Dr Jan Plesnik on the role of microevolution in response to climate-mediated selection as an adaptation to climate change. There was also considerable discussion regarding the imminent European Biodiversity Strategy (see *News in Brief* on pages 48-49).

Adapting to climate change was a theme that also featured heavily in the BES Conservation Ecology Specialist Group conference on 'Making Space for Nature – the Ecological Challenges of the Lawton Review' held at Charles Darwin House in London in April. After a presentation by Sir John Lawton on the *Making Space for Nature* report, attendees heard four very interesting perspectives on the implications of the recommendations. IEEM Fellow Dr Pete Brotherton summarised Natural England's response to the report (including using further designation of SSSIs to fill strategic gaps in the network). Professor Chris Thomas then gave a thought-provoking analysis of biodiversity conservation strategies in a changing climate and how we should be developing habitat management strategies to benefit species moving north to the UK from the continent. Dr Paul Dolman reported on work at the University of East Anglia to refine a biodiversity audit approach to develop a robust framework for determining conservation priorities. Finally Debbie Tann from Hampshire and Isle of Wight Wildlife Trust gave an overview of The Wildlife Trusts 'Living Landscapes' approach to landscape-scale conservation with two interesting case studies from Hampshire.

## Growing our Membership

Membership of the Institute continues to rise steadily but we are keen to reach our 5,000 target as quickly as possible in order to make our application for a Royal Charter. As a member you can do your bit by encouraging eligible colleagues to apply. Indeed they will thank you for encouraging them to apply before 1 October as from that date we will be introducing an initial joining fee (£10 Graduates, £25 Associates and Full members) in addition to the subscription fees to help cover the administrative costs associated with processing new applications. Please note that this is for new applicants only and does not affect those upgrading their membership.

## Membership Subscriptions 2011-12

Members will be receiving their renewal letters in August and we are pleased to announce that membership subscription rates will remain unchanged for the fourth consecutive year. Please note that if you wish to save £10 and change to paying by direct debit (Full and Associate members only) you must return your direct debit mandate to us by no later than 9 September 2011.

## Annual Conference 2011

### Rebuilding Biodiversity, Liverpool, 2-3 November 2011

The finishing touches have now been put to the programme for our annual conference and bookings will open in the near future. We are extremely pleased with the calibre of speakers and the breadth of content over the two days. You can now view the programme on our website.

## IEEM Tony Bradshaw Best Practice Awards

The 2011 IEEM Tony Bradshaw Best Practice Awards are now open for entries. For more information please visit: [www.ieem.net/awards.asp](http://www.ieem.net/awards.asp)

## Obituaries

We were sad to learn of the death of **Monica Hale** in December 2010. Monica made major contributions to the field of sustainable development as an ecologist and was an internationally recognised leader in this subject area. As well as being a Fellow of the Institute, Monica was also a Founding member back in 1991.

We were also very sad to hear of the death in March this year of **Jonathan Woods**. Jonathan joined IEEM in 2004 as a Student member and moved through to Graduate and then Associate membership and had recently taken over his late father's consultancy, Michael Woods Associates.

Our thoughts are with both families at this time.

## Staff Changes

In recent months we have said goodbye to a number of valued staff members. **Anna Thompson** retired from the Institute at the end of April after more than 12 years as Membership Officer. Over that period Anna has been instrumental in helping the Institute to grow and increase its influence. The efficient membership processing and renewal systems that stand IEEM in such good stead are largely down to Anna. She has always been well known for her calm and helpful approach to members and potential members needing advice as well as to staff colleagues needing assistance. We are missing her already but wish her a very long and happy retirement. In her place we welcome **Gwen Heywood-Waddington** who, together with **Zacyntha Dunhill-Rice**, is committed to carrying on Anna's good work and delivering an excellent service to our current and prospective members.

We also said goodbye to **Kim Lipscombe**, who completed her marketing internship in April and celebrated by undertaking a sponsored hitchhike to Morocco to raise money for education projects in sub-Saharan Africa. Kim did some excellent work for us in updating some of our marketing materials and is no doubt destined for a successful marketing career in the future.

We have also had to say goodbye to **Sophie Miller**. Sophie is a Full member who volunteered part-time in the Winchester office whilst on maternity leave. She was a great help with a number of issues, particularly helping to put together the IEEM Summer Conference on 'Biodiversity and the Big Society', looking into models for biodiversity data management, and helping with consultation responses. We wish her all the best with the impending new arrival.

Meanwhile **Jessica Batchelor** joined us as our new Professional Affairs intern in March. Jessica is coordinating the review of the *Guidelines for Ecological Impact Assessment* and is working closely with a number of IEEM members who are contributing to the review. Jessica has also helped us to complete the review of the *Competencies for Species Survey*.

Finally, the Secretariat team has been joined by two new permanent staff members. **Richard Watts** joined us in May as Administrative Assistant and is already making a significant contribution in helping us to run an even smoother office. In addition we have been pleased to welcome **Becky May** as our Training and Professional Development Officer replacing **Nick Jackson** who has moved into the new role of Marketing and Communication Systems Officer. Becky will be leading on the development of our Professional Development Programme, organising our conferences and developing new educational initiatives. Nick will, however, still be very much at the heart of the Secretariat team and will undoubtedly be attending future conferences to ensure that the technical side of running such events goes without a hitch.

# East Midlands Section News

## East Midlands Shadow Section - Relaunch!

**T**he Wildlife Trust's site on Rutland Water was the location for the relaunch of the East Midlands Section. Roger Morris CEnv FIEEM chaired an evening of presentations from Andrew Baker MIEEM on bio-acoustics and their potential applications for biodiversity monitoring; Bob Edmonds CEnv MIEEM on the Bardon Hill Quarry Extension – a case study for using a biodiversity offset approach in the UK; Gerard Hawley MIEEM on the Mersey Life project which identified opportunities for river, riparian and floodplain restoration/creation and Tim Mackrill from the Wildlife Trust spoke on the Osprey Project based at the reservoir. They were all very interesting presentations each demonstrating the range of work with which members are involved.

Members present, and others that had contacted Kim Lipscombe during the organisation of the event, have expressed the desire for an active East Midlands Section covering: Derby, Derbyshire, Leicester, Leicestershire, Lincolnshire, Northamptonshire, Nottingham, Nottinghamshire and Rutland. To this end, Andrew Morris, a Graduate member working for Smiths Gore, has agreed to be the contact for the Section and will arrange a first meeting of Section members so as to take forward activities in the East Midlands.

If you are interested in being involved with the Committee, or can offer events or activities in the East Midland to network and share ecological experiences, please contact Andrew at [andrew.morris@smithsgore.co.uk](mailto:andrew.morris@smithsgore.co.uk), he will be only too pleased to hear from you!

# South West England Section News

## Axe Estuary Wetlands Field Visit

**O**n Saturday 29 January 2011 the South West England Shadow Section held a field visit to The Axe Estuary Wetlands near Seaton, East Devon. The event was hosted by Mike Williams of the Environment Agency, and Fraser Rush, the East Devon Nature Reserves Officer. Despite the bitter cold we had a good turn out with about 45 attendees.

The objective was to visit various parts of the East Devon District Council's Local Nature Reserve, and to view habitat creation work, visitor facilities, and hear about future plans. Additionally, we would look at the Environment Agency's prototype self-regulating tidegate, which controls tidal flooding of Black Hole Marsh.

The first stop was Colyford Common and Marsh, which is part of the Access to Wetlands Scheme. As we walked into the reserve we were greeted by the sound of curlews in the surrounding fields; an encouraging call through the chilling breeze. The site is a mosaic of freshwater grazing marsh, ponds, reed-beds and ditches. During high tides the area is flooded; an event which takes place around 10 times a year. When deeply flooded, the wooden walkway is submerged up to 1 m, so it is sturdily

constructed. It provides suitable and safe wheelchair access across the marsh, and leads to a bird hide on Colyford Common, looking out over the Axe and Axmouth marshes. The management relies on a large group of volunteers who check and count the red ruby cattle used to graze the site.

Colyford Common and Marsh is a haven for shelduck, teal, and around 800 wigeon, and each of these species is regularly ringed here. It is also home to around 20 breeding little egrets, and one

of the few locations where redshanks breed. The site provides a plentiful supply of crustaceans, molluscs and amphipods for heron, black-tailed godwits, dunlin, ringed plover, curlew, and sandpiper, as well as rarities such as solitary sandpiper, glossy ibis, and the merlin, seen during our visit. The various tidal and planted reed-beds provide nesting habitat for many passerines such as reed and sedge warblers, as well as providing temporary cover for birds from the sights of wildfowling.



Figure 1. The boardwalk across Colyford Common





**Figure 2. The field study centre at Stafford Marsh**

Next on the agenda was Stafford Marsh; a previously drained arable land which had been heavily improved. The area is now a mosaic of marshland habitats managed for educational use. A grant from the 'Making it Local' scheme has enabled the reserve to create hides and improve the access for disabled visitors. They have also been able to build a field studies room which has a barn owl access point to the loft. The building work is almost complete and should be ready for action this year.

We next visited Black Hole Marsh, acquired in 2008 by East Devon County Council. It is now a saline lagoon created by excavating a large shallow scrape, with the spoil from the works used to create islands. Access to the hide is

screened by an earth bund and fencing, preventing disturbances to birds. The hexagonal hide allows excellent views of the 17 radially situated islands in the lagoon. They vary in topography, substrate and ground cover. Some are flat, whilst others are lumpy with rough surfaces, muddy, or grass covered. The grassy islands are riddled with voles providing good foraging for barn owls, and are currently managed by strimming. This may not be required at all if the introduction of rabbits is successful. One island is surfaced with shingle to provide good conditions for gulls, lapwings, oystercatchers, mallards and swans.

Next we viewed the tidegate system through the embankment of the Seaton and District Electric Tramway. The



**Figure 3. The hexagonal hide at Black Hole Marsh**



**Figure 4. The self-regulating tidegate**

Environment Agency worked with local engineering company, Stonemans, to create the self-regulating tidal exchange gate. The prototype was installed in January 2009, using a 900 mm pipe, with a flat plate controlled by the tide. There is one open position allowing water to enter the site during the latter stages of the tide, and two closed positions during low tide and full tide to prevent fresh and fully saline water from entering the lagoon. The gate is set to a 14 day cycle, gradually getting higher during the spring tides.

The cornerstone of the success of this site is the ability to maintain conditions suitable for the amphipod *Corophium volvulator*; a small shrimp-like invertebrate resistant to fluctuations in salinity. It can occur in high densities of up to 40,000 m<sup>-2</sup>, and even during periods of low rainfall these lagoons can maintain sufficient numbers of these invertebrates, improving the survival and growth rate of chicks. Without this system in place, the area would revert to saltmarsh. However, the freshwater-saline management of the lagoons present today creates habitat abundant with diverse birdlife. The controlled conditions for food resources, micro-topography for nesting and breeding birds, along with predator controls are all components promising great success on this site, both now and for the future.

Many thanks to Colin Bonfield MIEEM for producing the above article and also to Mike Williams of the Environment Agency and Fraser Rush of East Devon District Council for running the event. Further details can be seen at [www.eastdevon.gov.uk/countryside-axe\\_estuary-page](http://www.eastdevon.gov.uk/countryside-axe_estuary-page).

If you would like to organise a field visit or event, please contact Matt Jones, the South West Section Convenor: [mattj@eadconsult.co.uk](mailto:mattj@eadconsult.co.uk) or 01392 260420.

# Partnership News

## Society for the Environment

The Society is currently recruiting for a new Chief Executive Officer.

They have recently undertaken a review of their activities and have commissioned a report on their future strategic direction, which is currently being considered by the Board.

Despite the economic downturn, Chartered Environmentalist (CEnv) numbers continue to grow. The Society has also recently reviewed and updated its practice directions on CEnv eligibility and assessment of competence.

[www.socenv.org.uk](http://www.socenv.org.uk)

## European Network of Environmental Professionals

The latest ENEP General Assembly was held in Frankfurt in April 2011. One of the items to come out of this meeting was that ENEP has agreed to look into the possibility of an European Environmental Professional accredited designation.

The Network had an exhibition stand at the European Commission's Green Week at the end of May. This year's theme was Resource Efficiency.

If you have not yet responded, the ENEP survey is open until Friday 17 June 2011 at [www.surveymonkey.com/s/CYX7YXL](http://www.surveymonkey.com/s/CYX7YXL).

Jason Reeves (IEEM Policy and Information Officer) continues to act as ENEP's Co-ordinator and Mike Barker (IEEM Company Secretary) is the chair of ENEP's Biodiversity Working Group.

[www.environmentalprofessionals.org](http://www.environmentalprofessionals.org)

## Countryside Management Association

Over recent months Countryside Management Association (CMA) and IEEM have been discussing ways to work more closely together, and as a result of these discussions it has been agreed that we should continue to work closely together and encourage joint events through our respective Geographic Sections.

[www.countrysideassociation.org.uk](http://www.countrysideassociation.org.uk)

## Association of Local Government Ecologists

IEEM has been working more closely with the Association of Local Government Ecologists (ALGE) in recent months, including submitting some joint consultation responses and promoting a joint conference on the Big Society.

We have also identified that there is a lot of synergy and value in working together towards common goals and we will continue to explore this over the coming months.

[www.alge.org.uk](http://www.alge.org.uk)

## British Ecological Society

IEEM and the British Ecological Society (BES) have recently contacted all the newly-elected or returned MPs in the devolved administrations following the elections in early May.

[www.britishecologicalsociety.org](http://www.britishecologicalsociety.org)

## Institute of Environmental Professionals - Sri Lanka

The Institute of Environmental Professionals Sri Lanka (IEP-SL) originally only admitted individuals with an environmental degree and experience in the same sector. At the 4th Council meeting of the IEP-SL in 2008 it was decided to find ways to accommodate Corporate Members (CMs) as well.

The overall objective of establishing the IEP-SL is to uphold the dignity and raise and reputation of not only the environmental profession in Sri Lanka, but also increase awareness of the need for environmental services in the country at large, for the benefit of the public. To achieve this, the active participation of the corporate sector is essential.

A Code of Ethics has been developed to provide guidelines for the CMs who join the IEP-SL. It provides a basis for evaluating a CM's work from an environmental and ethical point of view. By heeding to this code, CMs will be able to preserve and enhance public trust in the discipline of environmental management. It emphasises the obligations of CMs to society and to the IEP-SL.

There are several applicants for CM of the IEP-SL. On 22 March 2011, the first corporate membership was ceremonially offered to Bandaranaike Memorial International Conference Hall (BMICH), at an event coinciding with International Water Day. BMICH is the largest conference hall in Sri Lanka and, therefore frequented by major corporate, government and non-governmental organisations. It will be an excellent high profile 'showcase' for IEP-SL and the environmental profession in Sri Lanka.

IEEM and IEP-SL signed a Memorandum of Understanding in June 2009 and following on from this a number of reciprocal activities have been agreed, including submitting relevant information and articles to *In Practice*.

We would also like to acknowledge the generous time and help given by Kate Jeffreys CEnv MIEEM and Andy King MIEEM from Geckoella Environmental Consultants in helping to move this partnership forward.

[www.iepsl.lk](http://www.iepsl.lk)





# Recent Publications



## The Crested Newt - A dwindling pond-dweller

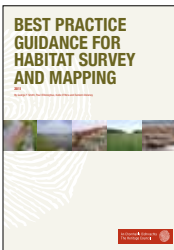
**Authors:** Robert Jehle, Burkhard Thiesmeier and Jim Foster

**ISBN-13:** 978-3-933066-44-2

**Price:** £20 / €22

**Available from:** [secretary@thebhs.org](mailto:secretary@thebhs.org)

This book draws together research and observations on the six species of crested newt across their range. It examines their taxonomy, biology, ecology and behaviour. Incorporating the latest research, the book also contains sections of special relevance to the great crested newt in the UK, with a focus on conservation and management. The authors hope that the book will assist the conservation of crested newts – which are experiencing declines in many areas – by providing an up-to-date overview of these species.



## Best Practice Guidance for Habitat Survey and Mapping

**Authors:** George F Smith MIEEM, Paul O'Donoghue CEnv MIEEM, Katie O'Hora and Eamonn Delaney AIEEM

**ISBN-13:** 978-1-9-06304-14-0

**Price:** Free download

**Available from:** <http://bit.ly/jxVwKd>

The final version of the Heritage Council's *Best Practice Guidance for Habitat Survey and Mapping* is now available to download. This publication presents current best practice guidance for survey and mapping of habitats in the Republic of Ireland, and is aimed primarily at those who conduct or commission habitat surveys. Its objective is to standardise and improve habitat survey and mapping methods in order to achieve compatibility among surveys and surveyors, and to ensure the quality and consistency of the maps and data produced.



## Marine Ecology: Concepts and Applications

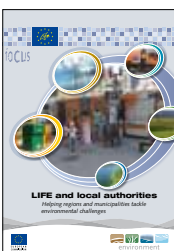
**Authors:** Martin Speight and Peter Henderson

**ISBN-13:** 978-1-4443-3545-3

**Price:** £34.99 / €44.90

**Available from:** [www.wiley.com](http://www.wiley.com)

This book aims to give insight into how marine ecosystems function, how they are effected by natural and human intervention, and how we can conserve and manage them sustainably for the good of people, both recreationally and economically. It explains the principles of oceanography that are important to ecology, discuss the magnitude of marine biodiversity and the factors that influence it, and cover the functioning of marine ecosystems both within trophic levels and up to different trophic level interactions. The text also includes chapters on the applied aspects of marine ecology, fisheries, human impacts, and management and conservation.



## LIFE and Local Authorities

**Authors:** Gabriella Camarsa et al.

**ISBN-13:** 978-92-79-18643-1

**Price:** Free download

**Available from:** <http://bit.ly/gis2Rw>

As well as an introduction to the policy challenges facing local and regional authorities and how the LIFE programme can help them, this publication features extensive case studies

and examples of best practice across a number of sectors: from sustainable transport to waste and water management, the threat of climate change to spatial planning.



## Fen Management Handbook

**Editors:** Andrew McBride et al.

**Price:** Free download

**Available from:** <http://bit.ly/jFgi5J>

The UK supports a wide variety of different fen types, ranging from tiny fragments to extensive mosaics of wetland habitats at a landscape scale. Once highly valued for their products, their use within social and agricultural systems declined with the advent of intensive agriculture, drainage and mechanisation. Many remaining fens were abandoned and became dominated by unpalatable vegetation or invaded by scrub and trees. This handbook highlights practical techniques but also provides the background science that underpins the different fen management techniques. The handbook is aimed at anyone involved in fen management, creation or restoration from a practical, policy or planning perspective.



## Ecology of Fresh Waters: A View for the Twenty-First Century (4th Ed)

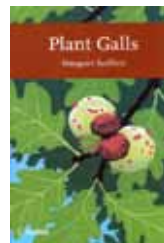
**Author:** Brian Moss

**ISBN-13:** 978-1-4051-1332-8

**Price:** £37.50

**Available from:** [www.wiley.com](http://www.wiley.com)

This new edition provides a comprehensive and stimulating introduction to rivers, lakes and wetlands and was written as the basis for a complete course on freshwater ecology. Designed for undergraduate and early postgraduate students who wish to gain an overall view of this vast subject area, this accessible guide to freshwater ecosystems and man's activities will also be invaluable to anyone interested in the integrated management of freshwaters. The scientific content of the text has been fully revised and updated, making use of the wealth of data available since publication of the last edition. Brian Moss was the 2010 recipient of the IEEM Medal.



## Plant Galls

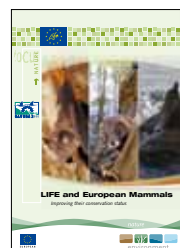
**Author:** Margaret Redfern

**ISBN-13:** 9780002201445

**Price:** £21.50

**Available from:** [www.nhbs.com](http://www.nhbs.com)

The subject of plant galls is wide-ranging, and yet much remains unknown since most galls do not cause any economic damage to crop plants resulting in limited research funding. However, the insect cycles and gall structures are amazing examples of the complexity of nature. The author explores these fascinating complexities, providing insight into the variety of galls of different types caused by a wide range of organisms including fungi, insects and mites. She discusses the ecology of galls more generally and focuses on communities of organisms within galls, the evolution and distribution of galls, and human and historical perspectives. This is the latest volume in the *New Naturalist* series.



## LIFE and European Mammals

**Author:** João Pedro Silva et al.

**ISBN-13:** 978-92-79-19266-1

**Price:** Free download

**Available from:** <http://bit.ly/ihq5ND>

This brochure highlights many of the actions that the EU has supported and offers a valuable overview of what has been achieved and how we, together with a wide range of stakeholders, can succeed in securing the future of Europe's diverse range of mammals, both great and small.

# In the Journals

JPG Jones

## Monitoring species abundance and distribution at the landscape scale

*Journal of Applied Ecology* 2011, 48: 9-13

This paper addresses some of the challenges presented by monitoring at the landscape scale, how models of species distribution can be used to inform policy, and discusses how monitoring at the global-scale could be approached. Collecting data over a large area is inherently costly, so methods which can provide robust information at low-cost are particularly valuable. The authors present two papers which test low-cost approaches against more data-hungry methods (indices of abundance vs. direct density estimates, and species distribution models built from presence-only vs. presence/absence data). Monitoring is needed for many purposes including auditing past management decisions and informing future choices. Much monitoring data are collected at the site scale, although management authorities increasingly recognise landscape-scale dynamics. Recent global targets for conservation require monitoring which can report trends at the global-scale. The authors conclude that integrating data collected at a variety of scales to draw robust inference at the scale required is a challenge which deserves more attention from applied ecologists.

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A Mortelliti *et al.*

## Independent effects of habitat loss, habitat fragmentation and structural connectivity on the distribution of two arboreal rodents

*Journal of Applied Ecology* 2011, 48: 153-162

Few studies have evaluated the independent effects of habitat loss and habitat fragmentation on the distribution of vertebrates, and none has evaluated the independent effect of changes in structural connectivity. The authors carried out a landscape-scale experiment to assess the independent contribution of these three processes and to examine what landscape scale factors affect the distribution of two forest-dependent arboreal rodents: the hazel dormouse *Muscardinus avellanarius* and the red squirrel *Sciurus vulgaris*. Habitat loss, rather than habitat fragmentation *per se*, was the major driver of distribution patterns for both species. As predicted, structural connectivity (hedgerow networks) played an important role in determining the distribution of the hazel dormouse, but not of the red squirrel. The models predicted that long lengths of hedgerows (>30 km) are unlikely to increase the probability of occurrence of hazel dormouse in landscapes where there are low levels of forest cover (<5%–10%). The findings indicate that structural connectivity and habitat loss may have additive effects on vertebrate distribution. For the hazel dormouse, improving structural connectivity will be ineffective if the amount of forest cover in the landscape is less than 5–10%. The key message from this study is that resources should not be invested in landscape linkages until their efficacy for the given level of suitable habitat has been assessed.

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JC Garvin *et al.*

## Response of raptors to a windfarm

*Journal of Applied Ecology* 2011, 48: 199-209

A pre- and post-construction study was conducted to determine the impact of a windfarm on the abundance and

behaviour of raptors in Wisconsin, USA. Variation in abundance and behaviour was examined both within and among years and relative to selected spatial, temporal and weather covariates. Raptor avoidance rates and indices of collision risk were calculated. Raptor abundance post-construction was reduced by 47% compared to pre-construction levels. Flight behaviour varied by species, but most individuals remained at a distance of at least 100 m from turbines and above the height of the rotor zone. The decline in raptor abundance post-construction together with other lines of evidence suggests some displacement from the windfarm project area. While certain species may be at risk, flight behaviour data and mortality estimates indicate that the majority of raptors may not be directly affected by the presence of turbines. The avoidance rates recorded in this study should be used to improve collision risk models, and both current and future windfarms should investigate avoidance behaviour post-construction.

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W Halfwerk *et al.*

## Negative impact of traffic noise on avian reproductive success

*Journal of Applied Ecology* 2011, 48: 210-219

The acoustic signals used by birds and other animals are increasingly masked by traffic noise. Masking of signals important to territory defence and mate attraction may have a negative impact on reproductive success. Depending on the overlap in space, time and frequency between noise and vocalizations, such impact may ultimately exclude species from suitable breeding habitat. However a direct impact of traffic noise on reproductive success has not previously been reported. The authors monitored traffic noise and avian vocal activity during the breeding season alongside a busy Dutch motorway. They measured variation in space, time and spectrum of noise and tested for negative effects on avian reproductive success using long-term breeding data on great tits *Parus major*. Traffic noise had a negative effect on reproductive success with females laying smaller clutches in noisier areas. Variation in traffic noise in the frequency band that overlaps most with the lower frequency part of great tit song best explained the observed variation. Additionally, noise levels recorded in April had a negative effect on the number of fledglings, independent of clutch size, and explained the observed variation better than noise levels recorded in March. The authors found that breeding under noisy conditions can carry a cost, even for species common in urban areas. Such costs should be taken into account when protecting threatened species, and they argue that knowledge of the spatial, temporal and spectral overlap between noise and species-specific acoustic behaviour will be important for effective noise management. The authors suggest some cost-effective mitigation measures such as traffic speed reduction or closing of roads during the breeding season.

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A Amar *et al.*

## Long-term impact of changes in sheep *Ovis aries* densities on the breeding output of the hen harrier *Circus cyaneus*

*Journal of Applied Ecology* 2011, 48: 220-227.

The hen harrier population on the Orkney Islands in Scotland has been monitored since 1975 and represents an ideal case study for considering the impact of sheep de-stocking on a key predator. Declines in the harrier population were associated



with a doubling in sheep numbers between the early 1980s and the late 1990s. Subsequently, as sheep numbers have fallen, the harrier population has recovered. These changes indicate an association but no clear mechanism. The authors tested whether reductions in sheep numbers have led to increases in harrier prey or preferred foraging habitat. They then tested whether breeding output over the last 33 years correlates with sheep stocking levels or variation in weather conditions (rainfall and temperature). Orkney sheep numbers declined by about 20% between 1998 and 2008. Surveys in 1999–2000 and repeated in 2008 showed increases in rough grassland, the preferred harrier foraging habitat, and increases in a key prey species, the Orkney vole *Microtus arvalis orcadensis*. Overall, hen harrier breeding output over the last 33 years was significantly negatively correlated to both sheep abundance and spring rainfall. This study provides strong evidence for the consequences of changes in sheep numbers on a top predator. The results indicate that reductions in sheep numbers are likely to prove beneficial for some upland species, particularly small mammals and their predators.

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S Smout, R King and P Pomeroy

### **Integrating heterogeneity of detection and mark loss to estimate survival and transience in UK grey seal colonies**

*Journal of Applied Ecology* 2011, 48: 364–372

The authors present new developments in statistical methodology allowing in-depth analysis of realistic, complex biological models for longitudinal data sets. Important biological details such as mark-loss and recapture heterogeneity can be identified. They conducted a comparative analysis of long-term (1978–2006) capture–recapture data with various combinations of marking methods for adult female grey seals *Halichoerus grypus* at two UK colonies. Seals were identified using three different methods: flipper tags, brands, or natural pelage markings. Animals identified by brands or natural markings were re-sighted more effectively than those with tags. Flipper tag-loss rates differed between colonies, and there was evidence for non-independent tag-loss in double-tagged animals. There was also evidence at one colony for the presence of transient animals, which attend the colony for one year only. Apparent survival was higher and more consistent at one site, and the differences in survival between the two colonies were able to explain contrasting pup production trends at these sites. Longitudinal studies allow for the estimation of demographic parameters which have important implications for our understanding of population dynamics and for the conservation and management of populations. Using new statistical developments to allow for the analysis of missing/incomplete data and partial observations, the authors show how survival can be estimated from complex mark–recapture data, allowing for the effects of mark loss. The re-sightability of different marks is estimated, indicating that photo-ID based on natural pelage markings is a very effective method for identifying grey seals. There are notable contrasts in survival estimates between breeding colonies which can explain contrasts in population trends at these sites, confirming the importance of adult survival in driving population dynamics in this long-lived species.

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A Anderson *et al.*

### **The potential of parasitoid Hymenoptera as bioindicators of arthropod diversity in agricultural grasslands**

*Journal of Applied Ecology* 2011, 48: 382–390

This study tested the hypothesis that parasitoid Hymenoptera are potential bioindicators that provide a useful means to

assess the wider biodiversity of arthropod populations in agro-ecosystems. A survey of 48 commercial farms was conducted and Generalised Linear Models used to investigate relationships between six taxa - parasitoid Hymenoptera, Coleoptera, Hemiptera, Diptera, Araneae and plants (species richness and sward height) - in agricultural grasslands. As well as relationships between these groups, the relationship of each individual group to the overall biodiversity of all other arthropod groups was explored. The authors show that, within agricultural grasslands, both the abundance and taxon richness of parasitoid Hymenoptera are more closely related with overall arthropod diversity than any other arthropod group investigated. The use of parasitoid abundance provides a simple and practicable monitoring tool for tracking change in wider arthropod diversity in agro-ecosystems.

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S Hladyz *et al.*

### **Impacts of an aggressive riparian invader on community structure and ecosystem functioning in stream food webs**

*Journal of Applied Ecology* 2011, 48: 443–452

Bioassessment in running waters has focused primarily on the impacts of organic pollution on community structure. Other stressors (e.g. invasive species) and impacts on ecosystem processes have been largely ignored in many riverine biomonitoring schemes, despite being required increasingly by environmental legislation. Exotic riparian plants can exert potentially powerful stresses by altering both autochthonous and allochthonous trophic pathways. The authors examined the impact of *Rhododendron ponticum* on community structure and three key ecosystem processes (decomposition, primary production, and herbivory) in nine streams bordered by three characteristic vegetation types (deciduous woodland, pasture, or *Rhododendron*). Community structure and ecosystem process rates differed among vegetation types, with autochthonous pathways being relatively more important in the pasture streams than in the woodland reference streams. Overall ecosystem functioning, however, was compromised in the invaded streams because both allochthonous and autochthonous inputs were impaired. *Rhododendron's* poor quality litter and densely shaded canopy suppressed decomposition rates and algal production, and the availability of resources to consumer assemblages. Combining measures of invertebrate abundance, rates of litter decomposition and algal production in future bioassessments of stream ecosystem functioning can help to make better informed management decisions and to develop more focused priorities for mediating the negative effects of riparian invasions. The authors provide a series of specific recommendations for dealing with invasive riparian plants in general, and *Rhododendron* in particular, in order to minimize their impacts on stream ecosystems.

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LP Shoo *et al.*

### **Engineering a future for amphibians under climate change**

*Journal of Applied Ecology* 2011, 48: 487–492.

Altered global climates in the 21st century pose serious threats for biological systems and practical actions are needed to mount a response for species at risk. The authors identify management actions from across the world and from diverse disciplines that are applicable to minimising loss of amphibian biodiversity under climate change. Actions were grouped under three thematic areas of intervention: (i) installation of microclimate and microhabitat refuges; (ii) enhancement and restoration of breeding sites; and (iii) manipulation of hydroperiod or water levels at breeding

sites. There are currently few meaningful management actions that will tangibly impact the pervasive threat of climate change on amphibians. A host of potentially useful but poorly tested actions could be incorporated into local or regional management plans, programmes and activities for amphibians. Examples include: installation of irrigation sprayers to manipulate water potentials at breeding sites; retention or supplementation of natural and artificial shelters (e.g. logs, cover boards) to reduce desiccation and thermal stress; manipulation of canopy cover over ponds to reduce water temperature; and, creation of hydrologically diverse wetland habitats capable of supporting larval development under variable rainfall regimes. The authors encourage researchers and managers to design, test and scale up new initiatives to respond to this emerging crisis.

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J Bennie, K Anderson and A Wetherelt

### Measuring biodiversity across spatial scales in a raised bog using a novel paired-sample diversity index

*Journal of Ecology* 2011, 99: 482–490.

The authors describe a new method for spatial analysis of species diversity, based on a paired-sample version of the widely used Gini–Simpson diversity index and its numbers equivalent. The index and its numbers equivalent are plotted as a function of lag distance between two samples along spatial and/or environmental gradients. The authors demonstrate the potential of this approach by applying it to two transects of fine-scale (5 × 5 cm quadrat) vegetation data from sites with contrasting hydrology within a raised bog, where the location of each quadrat is accurately recorded and the height of the bog surface above the water table is measured using a terrestrial laser scanner. Both transects have similar alpha-diversity as measured using the Gini–Simpson index, and the transition between alpha- and gamma-diversity occurs at similar length scales, suggesting that species aggregate at similar scales along both transects. However, the transect from the central bog dome has higher gamma-diversity than that from the bog margin, and shows more marked significant spatial structure at a length scale of 135–140 cm, corresponding to the typical hummock–hollow microtopography at the site. They show that beta-diversity at both transects can be attributable to both species clustering along the hydrological gradient, consistent with niche partitioning, as well as independent spatial aggregation of species that is not explained by hydrology. The paired-sample diversity index described here is a potentially useful tool in detecting and attributing patterns of beta-diversity along both spatial and environmental gradients.

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P De Frenne *et al.*

### Interregional variation in the floristic recovery of post-agricultural forests

*Journal of Ecology* 2011, 99: 600–609

Worldwide, the floristic composition of temperate forests bears the imprint of past land use for decades to centuries as forests regrow on agricultural land. Many species, however, display significant inter-regional variation in their ability to (re) colonise post-agricultural forests. The authors compiled data on 90 species and 812 species × study combinations from 18 studies across Europe that determined species' distribution patterns in ancient and post-agricultural forests. The authors showed for the first time on a continental scale that the recovery of short-lived forest herbs increased with the forest habitat availability in the landscape. Small perennial forest herbs, however, were generally unsuccessful in colonising post-agricultural forest – even in relatively densely forested

landscapes. Hence, the results stress the need to avoid ancient forest clearance to preserve the typical woodland flora.

Correspondence: pieter.defrenne@ugent.be

L Taylor and DL Roberts

### Biological Flora of the British Isles: *Epipogium aphyllum* Sw.

*Journal of Ecology* 2011, 99: 878–890

This account provides information on all aspects of the biology of the ghost orchid *Epipogium aphyllum* Sw. (repeatedly described as Britain's rarest orchid) that are relevant to understanding its ecological characteristics and behaviour. The main topics are presented within the standard framework of the *Biological Flora of the British Isles* - distribution, habitat, communities, response to biotic factors, responses to environment, structure and physiology, phenology, reproductive characteristics, herbivores and disease, history and conservation.

Correspondence: linxtaylor@hotmail.com

JP Rodríguez *et al.*

### Establishing IUCN Red List Criteria for Threatened Ecosystems

*Conservation Biology* 2011, 25: 21–29

The potential for conservation of individual species has been greatly advanced by the International Union for Conservation of Nature's (IUCN) development of objective, repeatable, and transparent criteria for assessing extinction risk that explicitly separate risk assessment from priority setting. At the IV World Conservation Congress in 2008, the process began to develop and implement comparable global standards for ecosystems. A working group established by the IUCN has begun formulating a system of quantitative categories and criteria, analogous to those used for species, for assigning levels of threat to ecosystems at local, regional, and global levels. A final system will require: definitions of ecosystems; quantification of ecosystem status; identification of the stages of degradation and loss of ecosystems; proxy measures of risk (criteria); classification thresholds for these criteria; and standardised methods for performing assessments. The system will need to reflect the degree and rate of change in an ecosystem's extent, composition, structure, and function, and have its conceptual roots in ecological theory and empirical research. On the basis of these requirements and the hypothesis that ecosystem risk is a function of the risk of its component species, the authors propose a set of four criteria: recent declines in distribution or ecological function, historical total loss in distribution or ecological function, small distribution combined with decline, or very small distribution. Most work has focused on terrestrial ecosystems, but comparable thresholds and criteria for freshwater and marine ecosystems are also needed. These are the first steps in an international consultation process that will lead to a unified proposal to be presented at the next World Conservation Congress in 2012.

Correspondence: jonpaul@ivc.gov.ve

TG Hallam and GF McCracken

### Management of the Panzootic White-Nose Syndrome through Culling of Bats

*Conservation Biology* 2011, 25: 189–194

In the United States, white-nose syndrome (WNS) is rapidly spreading and is associated with a psychrophilic fungus, *Geomyces destructans*. WNS has caused massive mortality of bats that hibernate and efforts to control the disease have been ineffective. The culling of bats in hibernacula has been proposed as a way to break the transmission cycle or

slow the spread of WNS. The authors formulated a disease model to examine the efficacy of culling to abate WNS in bat populations. They based the model dynamics on disease transmission in maternity roosts, swarms, and hibernacula, which are the arenas of contact among bats. The simulations indicated culling will not control WNS in bats primarily because contact rates are high among colonial bats, contact occurs in multiple arenas, and periodic movement between arenas occurs.

Correspondence: thallam@utk.edu

J Foley *et al.*

### Investigating and Managing the Rapid Emergence of White-Nose Syndrome, a Novel, Fatal, Infectious Disease of Hibernating Bats

*Conservation Biology* 2011, 25: 223–231

Information is lacking on the pathogenesis of *Geomyces destructans* and white nose syndrome (WNS), WNS transmission and maintenance, individual and site factors that contribute to the probability of an outbreak of WNS, and spatial dynamics of WNS spread in North America. The authors considered how descriptive and analytical epidemiology could be used to fill these information gaps. They catalogued and critiqued adaptive-management options that have been either previously proposed for WNS or were helpful in addressing other emerging diseases of wild animals. These include an ongoing program of prospective surveillance of bats and hibernacula for WNS, treatment of individual bats, increasing population resistance to WNS (through vaccines, immunomodulators, or other methods), improving probability of survival from starvation and dehydration associated with WNS, modifying hibernacula environments to eliminate *G. destructans*, culling individuals or populations, controlling anthropogenic spread of WNS, conserving genetic diversity of bats, and educating the public about bats and bat conservation issues associated with WNS.

Correspondence: jefoley@ucdavis.edu

DJ Abson and M Termansen

### Valuing Ecosystem Services in Terms of Ecological Risks and Returns

*Conservation Biology* 2011, 25: 250–258

Placing monetary values on ecosystem services is often suggested as a necessary step in correcting market failures. The authors consider the effects of valuing different types of ecosystem services within an economic framework. The authors argue that provisioning and regulating ecosystem services are generally produced and consumed in ways that make them amenable to economic valuation. The values associated with cultural ecosystem services lie outside the domain of economic valuation, but their worth may be expressed through non-economic, deliberative forms of valuation. They argue that supporting ecosystem services are not of direct value and that the losses of such services can be expressed in terms of the effects of their loss on the risk to the provision of the directly valued ecosystem services they support. The authors propose a heuristic framework that considers the relations between ecological risks and returns in the provision of ecosystem services. The proposed ecosystem-service valuation framework, which allows the expression of the value of all types of ecosystem services, calls for a shift from static, purely monetary valuation toward the consideration of trade-offs between the current flow of benefits from ecosystems and the ability of those ecosystems to provide future flows.

Correspondence: d.abson@see.leeds.ac.uk

SM Hearn *et al.*

### The repeatability of vegetation classification and mapping

*Journal of Environmental Management* 2011, 92: 1174–1184

The mapping of habitats as defined by plant communities is a common component of the planning and monitoring of conservation management. However, there are major concerns about the subjectivity and risk of observer bias in most commonly used plant community mapping protocols. This study provides the first test of the consistency of habitat maps based on the mapping units defined by the National Vegetation Classification (NVC), the most widely used classification of plant communities used for habitat mapping on conservation sites in the UK. Seven surveyors mapped the same upland site within five weeks in summer 2008 and the spatial correspondence of the resulting maps was assessed. The NVC is a hierarchical classification and pair-wise spatial agreement between maps decreased with lower levels of sub-classification. The average area of agreement between maps was 77.6% at the habitat level, 34.2% at the community level and 18.5% at the sub-community level. Spatial disparity in the location of mapped boundaries between vegetation types only made a small contribution to overall differences; the majority of variation between maps was due to discrepancies in classification, with vegetation types containing similar species composition most often confused. Factors relating to surveyor effort (cost, time taken and length of route) were not able to explain the substantial differences between maps. However, the methods used to assign areas to vegetation type did seem to have an effect, with surveyors who relied primarily on their own experience having the highest levels of mean agreement with other maps. The study raises serious concerns with current practice of using the NVC for site description and monitoring/surveillance. The authors recommend that further work is carried out with the aim of determining the degree and source of variation between surveyors and how consistency can be increased.

Correspondence: s.m.hearn@univ.bangor.ac.uk

RHG Ranil *et al.*

### Presumed extinctions in the pteridophyte flora of Sri Lanka

5th symposium on Asian Pteridology, 15-21 November 2010, Shenzhen Fairy Lake Botanical Garden, Shenzhen, China

Sri Lanka is a centre of diversity in Asia, having a high level of pteridophyte (fern) diversity in terms of number of species per unit area. It is generally accepted that island populations are subjected to higher risks of extinction than wider-spread mainland populations. In this study, 348 species described in the *Flora of Ceylon* (2006) were evaluated for their threat status, of which 34 species (10%) were identified as probably being extinct from Sri Lanka, including 7 endemic species. Such extinct species have been collected before 1900 by European botanists. All such species have been restricted to the wet zone forests in Sri Lanka, apart from *Asplenium disjunctum* Sledge which is located in the intermediate zone of the country. The need for more research is paramount since, at present, data on the rates and directions of biodiversity loss remains scarce and often uncertain in pteridophytes. Such assessment would bring about the existence of a wealth of information on the pteridophyte flora of Sri Lanka as well as provide a basis for general conservation issues of the island pteridophyte flora faced.

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# News in Brief

## **Forthcoming guidance on working with wildlife**

CIRIA's latest guide *Working with wildlife: guidance for the construction industry* (C691) is intended to be used to allow those working on construction projects to stay within the law, and to understand and adopt good practice in relation to wildlife. The guidance provides background on the fundamentals of ecology, considers the relationship between ecology and construction, provides an overview of the legislation governing action that can be taken with protected species and habitats, practical guidance on managing these and signposts further guidance. The guide will be published in summer 2011 and is accompanied by a CD-Rom containing a series of toolbox talks, and habitat and species briefings. More information: [www.ciria.org](http://www.ciria.org) or [enquiries@ciria.org](mailto:enquiries@ciria.org)

## **One-stop shop for crayfish professionals**

The recently launched UK Crayfish website ([www.crayfish.org.uk](http://www.crayfish.org.uk)) brings together up to date information about the White-clawed crayfish *Austropotamobius pallipes* and its conservation in the UK together with a range of information about non-native crayfish species, their impacts and control. The website includes both professional and public channels, a conservation toolkit for assessing an area and planning a conservation strategy and action, legislation and licensing, guidance on ark site selection, information on crayfish projects (including practical work to conserve threatened populations), and details on research projects looking at a range of crayfish species and issues in the UK. The website has been funded by the Environment Agency, with information compiled by Buglife, Stephanie Peay CEnv MIEEM and the Environment Agency.

## **Aerial photos open access catalogue linked to Warwickshire Wildlife Trust**

John Ball, a Retired member, is making his vast collection of about 6,000 images, digitally copied from slides and colour-negatives, available to the general public for use. These images are low-level steep oblique in form and give a three-dimensional effect to photographs that cannot be obtained from the vertical ones from the internet. They could be especially valuable for students or researchers studying changes in landscape, agriculture, historical ecology such as the presence of ridge and furrow fields, or the heritage of mining and quarrying. Warwickshire Wildlife Trust has a complete database of these digital images and initially they are putting a limited number of them online for free access and that can be downloaded. More information: [enquiries@wkwtr.org.uk](mailto:enquiries@wkwtr.org.uk) or [www.warwickshire-wildlife-trust.org.uk](http://www.warwickshire-wildlife-trust.org.uk).



**Aerial photo of Warwick Castle**  
Photo: John Ball

## **Winston Churchill Memorial Trust Fellowships**

Applications have now opened for Travelling Fellowships for 2012. The Trust gives grants to travel overseas to study areas of topical and personal interest, to gain knowledge and to enlarge the Fellow's experience for the benefit of their profession, community and the UK as a whole. The purpose of a Churchill Travelling Fellowship is to widen an individual's experience in such a way that he or she grows in confidence, knowledge, authority and ambition, and to bring benefit to others in the UK through sharing the results of their travel experience. Check your eligibility and categories on the website ([www.wcmt.org.uk](http://www.wcmt.org.uk)).

## **Local Record Centres Accreditation Pilot project**

ALERC (the Association of Local Environmental Records Centres) has successfully completed a pilot project to create and trial an accreditation scheme for Local Record Centres. The pilot was undertaken by Lincolnshire Environmental Records Centre and Cambridgeshire and Peterborough Environmental Records Centre with the help of funding from Natural England. The project reached its conclusion at the end of March, with both records centres successfully achieving the standards required using the criteria and guidance developed as part of the pilot. The results of the pilot were deemed sufficiently robust for ALERC to investigate a sustainable way to roll-out accreditation across the LRC community. Whilst not in a position to do this immediately, work is underway to move the process forward. In the meantime, copies of both the accreditation criteria and guidance documents will soon be hosted on the ALERC website ([www.alerc.org.uk](http://www.alerc.org.uk)) so LRCs will be able to start preparing themselves to apply for accreditation in the future.

## **Defra release statistics on public attitudes and knowledge about the environment**

The survey forms part of a wider public survey in England relating to lifestyles and public attitudes towards topical issues. In terms of environmental knowledge, when people were questioned specifically on how much they knew about 'climate change', 'ecosystem services', and 'biodiversity', 44% reported knowing a lot or a fair amount about climate change. Yet, 31% of respondents said they had never heard of the term 'biodiversity', and 28% of respondents said they had never heard of the term 'ecosystem services'. The release, despite indicating progress towards increased environmental awareness among members of the public, shows that there is still room for improvement of environmental education, particularly in relation to biodiversity and ecosystem services. More information: <http://bit.ly/eQejbT>

## **Bat Crime Review published**

The Bat Conservation Trust (BCT) has published a comprehensive review of bat related crime since the start of the BCT Investigations Project in 2003. In 2010, 301 incidents were reported to BCT, an increase of 45% on 2009. The Bat Crime Review outlines the future direction of the Investigations Project and presents where we will focus efforts in combating bat crime. More information: <http://bit.ly/iSCJhz>

## **Natural England unveils new hubs to handle land use consultations**

Natural England has announced the launch of a new approach to responding to planning consultations which offers a more consistent, quick and efficient service to our customers. To enhance its customer service, Natural England has set up a new system in which the planning consultations it handles are received via a central e-mail address, [consultations@naturalengland.org.uk](mailto:consultations@naturalengland.org.uk), replacing the old postal application system directed to local offices. The new service is underpinned by two newly established hubs (based in Crewe and Worcester) in which they

expect to process around 20,000 consultations in the first year. The remaining cases, about 50% of the total to start with, which require more detailed engagement, will be dealt with by specialist advisors. More information: <http://bit.ly/eX89dP>

### New Chair for Marine Management Organisation

Sir William (Bill) Callaghan has been appointed Chair of the Marine Management Organisation (MMO), the body responsible for managing England's marine resources. Sir Bill will chair the Board, which oversees the strategic direction of the MMO, from 1 May 2011 for three years. Dr Derek Langslow had been Acting Chair of the MMO since December 2010.

### New Deputy Chair for Natural England

The Secretary of State for Environment, Food and Rural Affairs has appointed Professor David Hill CEnv FIEEM as Deputy Chair of Natural England. The appointment will run until 30 September 2012.

### UNEP Green Economy Report published

The Report *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* has been compiled by UNEP's Green Economy Initiative in collaboration with economists and experts worldwide. It demonstrates that the greening of economies is not generally a drag on growth but rather a new engine of growth; that it is a net generator of jobs, and that it is also a vital strategy for the elimination of persistent poverty. The report also seeks to motivate policy-makers to create the enabling conditions for increased investments in a transition to a green economy. More information: <http://bit.ly/f2XXe7>

### New DG Environment factsheet

The European Commission's DG Environment has released a new factsheet on *Resource efficiency - a business imperative*. For the full list of useful factsheets visit: <http://bit.ly/ed9bAA>.

### EU 2020 biodiversity strategy

The European Commission has adopted an ambitious new strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets, and 20 actions to help Europe reach its goal. The six targets cover: full implementation of EU nature legislation to protect biodiversity; better protection for ecosystems, and more use of green infrastructure; more sustainable agriculture and forestry; better management of fish stocks; tighter controls on invasive alien species; and a bigger EU contribution to averting global biodiversity loss. More information: <http://bit.ly/jlvE7E>

### Public priorities for conservation revealed in European survey

Conservation efforts should focus on species that have recently declined in number, are harmless or are perceived as high value, according to a European public survey published in *Biological Conservation*. Participants also felt that disappearing habitats should be targeted for protection. The results suggest that, by choosing different criteria that more closely match the public's values and criteria, conservationists could improve public support for their work. The survey found that public views on conservation differ from those of biodiversity managers and conservationists, e.g. conservationists often focus on native species, but many members of the public interviewed for the survey did not consider 'nativeness' to be important. The researchers recommend conservationists focus on other criteria, such as recent population changes, harmfulness and value when setting conservation goals.

### Natura 2000 Network enlarged

Early this year, the European Commission announced that the Natura 2000 site lists were again updated, resulting in an expansion of almost 27,000 km<sup>2</sup>. This includes a major addition of new marine sites covering more than 17,500 km<sup>2</sup>, most of which are in Denmark, France and Spain. It also includes some new terrestrial sites, mainly in the Czech Republic and Poland. As well

as adding new sites, this update also includes minor modifications to some existing sites. More information: <http://bit.ly/jruWt2>

### New Natura 2000 management documents

DG Environment has published a new guidance document concerning the management of Natura 2000 sites in estuaries and coastal zones, with a particular emphasis on port development and dredging. The new guidance document can be downloaded at: <http://bit.ly/l11A4X>. There is also an accompanying European Commission working document entitled *Integrating biodiversity and nature protection into port development*, which can be downloaded at: <http://bit.ly/mDLCNf>.

### New EU working group on green infrastructure

The European Commission is planning to publish a Communication on Green Infrastructure that will further explain the concept, outline how it should be implemented and include a number of targets. To assist in this task, the European Commission has set up a working group to provide expert opinions and recommendations. This will then be further developed by the European Commission as part of its preparation of a policy on Green Infrastructure.

### Development of an EU instrument on alien invasive species

The EU is currently developing a dedicated EU instrument on alien invasive species. In preparation, the Commission has published a report on its website entitled *Assessment to support continued development of the EU strategy to combat IAS*. The Commission has also set up three working groups to support the development of the new policy instrument. More information: <http://bit.ly/ekMQHd>

### European Platform for Biodiversity Research Strategy (EPBRS)

EPBRS is a forum bringing together European scientists and policy-makers to discuss the interface between scientific research and biodiversity policy. The members are from EU Member States that participate in the EU's 7th Framework Programme for European Research, with each Member State appointing one scientist and one policy-maker to attend biannual meetings under the EU Presidencies. EPBRS focuses on the following research areas: using the components of biodiversity in a sustainable way; maintaining ecosystem functions that provide goods and services; conserving, protecting and restoring the natural world; and halting biodiversity loss. More information: [www.epbbs.org](http://www.epbbs.org)

### The Science of Marine Reserves

The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has published a new edition of its report, *Science of Marine Reserves*, focussing specifically on European marine reserves. This European edition looks at the effects of marine reserves on wildlife across Europe, and also design considerations and location. The report contains a series of case studies of reserves exclusively in Europe including the effects of the trawling and dredging ban in the Manx Bradda inshore ground and at two full no-take-zones – Lundy Island and Flamborough Head. More information: <http://bit.ly/m6tQhZ>

### Decade of Biodiversity

The Convention on Biological Diversity Secretariat has unveiled the official logo of United Nations Decade on Biodiversity (UNDB). The official slogan of the decade is: *Living in Harmony with Nature*. Further information: [UNBiodiversity@cbd.int](mailto:UNBiodiversity@cbd.int)



# Tauro-Scatology and 'Efficiency' Cuts

**With many IEEM members at the sharp end of the public sector cuts, the mood is ripe for some gallows humour so where better to turn than to our resident Professor of Tauro-Scatology, Basil O'Saurus? We meet him this month as he prepares for his latest foray into the world of reality television. What's this one called, Prof?**

This one is for all those public sector employees who are fed up with seeing Cameron smarming on about 'efficiency' as if he has only just invented this word...

**When, in reality, we go through a re-organisation every two or three years and, every time, the high-ups talk about 'efficiency' as they slice away at our capacity to do the job properly.**

Exactly. The first rule of the upper echelons of public sector management is to parrot the prevailing dogma as often as possible in the vain hope that it boosts your chance of an OBE.

**That's the Order of the Brown Extremity, of course? But how does this link to your new reality TV show?**

It is the ultimate guide to surviving the new, ultra-lean, public sector model. I call it *How to Look Good Knackered*. All we need before we can launch is a hyperactive, part-Oriental, extremely camp environmental scientist to front the show.

**What, exactly, does this show entail?**

Basically, our managers will talk-up our ability to deliver the same level of service despite having fewer people to do the work, so we'll all be working flat-out. They will give public assurances that we are still delivering a high quality service but we'll all be filled with nagging doubts about whether we are spreading ourselves too thinly.

**And this is where *How To Look Good Knackered* comes in?**

Exactly. I can't help you do your job properly but I can help you pretend you don't feel horribly compromised by the new regime. Which is, these days, a key transferable skill if you ever want to get promoted.

**So, how do you go about this?**

My expectation is that lots of our present activities will be streamlined. A Phase 2 NVS survey, for example, could be replaced by a Gear 3 NVS Survey - so named because the highly-trained surveyor will not be allowed time to tramp around a site making long lists of species. Instead, he or she will drop to third gear as they drive past, cast a glance out of the window and say, "can't see any endangered species," before putting his or her foot on the throttle and accelerating off to the next site.

As I am conscientious, I did actually watch an episode of *How To Look Good Naked* before writing this...

**That is suffering for your art...**

...and I learnt that one of Gok Wan's catch-phrases is, "love your best bits". Of course, if the future is as bleak as I have painted it, your personal integrity isn't going to be your best bit. So, in *How To Look Good Knackered*, I will have to make sure that you ditch this self-loathing.

**What is your secret?**

Same as Gok's actually... I burst in screeching "It's your Aunty Basil, girlfriend ...you look gorrnggggeoussss!" Then we go shopping.

**Is personal nudity involved at any point?**

Not in my version. It's basically just about buying new clothes in order to take your mind off all the compromises that you've had to make. That way, I not only help you forget the sheer awfulness of your own existence but, collectively, we revitalise the economy at the same time.

**Still not entirely convinced. Do you want to run any other ideas past us before you go?**

I do have one other idea, now you mention it. With university fees increasing, students will be wanting to make themselves as marketable as possible so they will be looking for every opportunity for work experience. Those of us in the public sector will see this as an opportunity to get some free labour around the office. But, of course, it can also create some awkward situations...

**...which you, as IEEM's resident Reality TV consultant, will exploit...**

Absolutely. Prepare yourself for *Hotter Than My Intern*.

**If the BBC can fritter away our license fee on this kind of trash, why not us too?**

My thinking exactly. And the Big Society offers plenty of scope to a tauro-scatologist too, but you will have to wait until the next issue to read about that.

**We can't wait. Thanks again for your time, Prof.**



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# Building with Nature



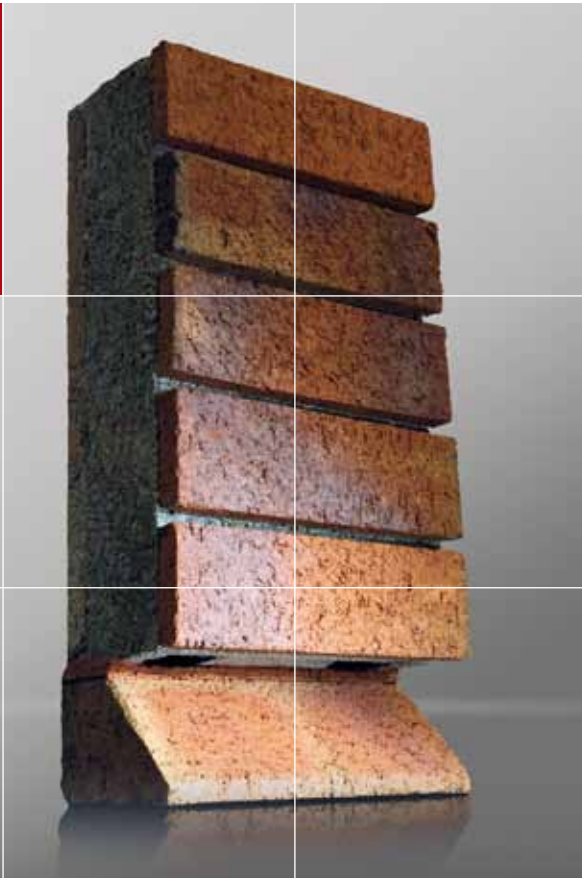
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# New and Prospective Members

## 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 Chief Executive Officer by telephone or letter before **8 July 2011**. Any communications will be handled discreetly. The decision on admission is usually taken by the Membership Admissions Committee under delegated authority from Council but may be taken directly by Council itself. IEEM is pleased to welcome applications for membership from the following:

### APPLICATIONS FOR FULL MEMBERSHIP

Associates applying to upgrade to Full membership were listed previously for their Associate application and are not listed again.

Mr Tim Barfield, Mr Phil Bolton, Dr Elizabeth Bradshaw, Miss Kelly Ann Dempsey, Mr Karl Forkasiewicz, Mr Mathew Liston, Mr Richard Mycock, Mr James Smith, Mrs Jane Smith, Mrs Anna Sutcliffe

### APPLICATIONS FOR ASSOCIATE MEMBERSHIP

Mr David Braidwood, Miss Toni Harrington, Mr Austin Hopkirk, Miss Monique Speksnyder

### APPLICANTS WISHING TO UPGRADE TO ASSOCIATE MEMBERSHIP

Miss Rebecca Close, Mr Nicolas Andrews-Gauvain

## ADMISSIONS

IEEM is very pleased to welcome the following new members:

### FULL MEMBERS

Mrs Emma Austin, Mr David Barlow, Dr Kerry Crawford, Mr Paul Evans, Dr Jonathan Flanders, Mr Adam Fulton, Mr George Greenshields, Mr Trevor Hall, Dr Alison Hannah, Mr Patrick Hatch, Mrs Amanda Honeysett, Miss Emily Jackson, Mr Rupert Johnson, Mr Robert Latimer, Mr Richard Lawrence, Dr Mathew Ling, Mr Mathew Loak, Mr Gerald Longley, Dr Jennifer Lord, Mrs Sally Moralee, Mr Mark Osborne, Mr Trevor Renals, Mr Alan Roscoe, Mr Donald Shields, Ms Lorna Slade, Mrs Eleanor Sorfleet, Ms Anna Swift, Mr Roy Tapping, Mr Neil Taylor, Ms Zoe Trent, Mr Paul Wagstaffe, Mr James Wilson, Miss Jodene Williams, Miss Cathryn Williamson, Mr Nigel Wood

### ASSOCIATE MEMBERS

Miss Joanne Balch, Mr Simon Boswell, Miss Carolyn Cowan, Mr Philip Dutt, Miss Sarah Guest, Miss Giulietta Holly, Mr Richard King, Mr Daniel Lombard, Mr Innes Muir, Mr Peter Owens, Mr Richard Pash, Miss Victoria Smith, Mr Michael Stopa, Mr Philip Thorpe, Mrs Naomi Vincent, Miss Amy Wright

### GRADUATE MEMBERS

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Mr Robert P Bennett, Mrs Amanda E Evans, Miss Hayley E Farnell, Mr Richard Gould, Mrs Julia C Mamalis, Mr Vincent R Muir, Ms Christina J Odell, Mr Jason D Reeve, Mr Hans-Erich Schulz, Mr Richard W Seabrook, Mrs Susan M Smallshire, Miss Emma Tattersdill, Mr Tim Willder

### STUDENT MEMBERS

Miss Josephine Arthur, Mr Michael J Ashford, Mr Jonathan E Barrett, Mr Sven P Batke, Mr Richard Berry, Miss Rebecca J Blamey, Mr Michael D Bryant, Mr Dennis J Buchanan, Mrs Sarah E Buck, Mr Philip Cannard, Mr Gary D Clewley, Ms Hayley Coristine, Miss Angela Creevy, Miss Lisa J Davies, Miss Catherine Dermody, Miss Lucy Ellis, Miss Suzanne Elson, Miss Erika Exelby, Miss Leonie Eyres, Mr James O Farrell, Mr Richard J Ferrett, Mr Benjamin R N Fitch, Miss Sophie Goddard, Miss Molly Gorman, Miss Casey-Ruth Griffin, Miss Jennifer Griffiths, Miss Keri L Harwood, Miss Rebecca Hilton, Miss Amelia Hodnett, Miss Kate Isger, Miss Christina Kimbrough, Miss Candice H Lambden, Miss Joanna Lawrence, Miss Joanne Lucas, Mr Logan Maggs, Miss Nathalie Marten, Mr Philip Mathews, Mr Gregg Milligan, Mr John R Minney, Miss Sarah Monaghan, Mr Glenn Moores, Miss Heather L Moorhouse, Mr Michael K Musgrave, Miss Elizabeth Napoda, Miss Victoria K Newlove, Mr Sebastian Overmans, Mr Toby Palmer, Mr Thomas Payne, Miss Shelley Pearce, Miss Angela Phillips, Mr Anthony G Phillips, Miss Sian Piper, Mr Timothy Precious, Miss Kirsty Radley, Mr Jonathan R Ramsey, Miss Hillary A P Rees, Mr Christopher J Rhodes, Mr Benjamin Richardson, Miss Amy R Robinson, Mr Charles Robinson, Lucy Rouse, Mr Alexander M Sams, Miss Amanda J Scott, Miss Sarah H Scott, Miss Anita C Sedgewick, Miss Holly Shingler, Mr Soujanya Shrivastava, Miss Jessica Tait, Miss Lucy Taylor, Miss Sarah C Teagle, Miss Danielle Thompson, Miss Siarrad Townley, Mr Atish Vadher, Miss Susie van Baarsel, Mr Joel N Walley, Miss Annalea J White, Mr Sean L Willmer, Mrs Lisa Woolridge

## UPGRADES

The following have successfully upgraded their membership:

### UPGRADES TO FULL MEMBERSHIP

Mr Daniel Alder, Mr David Allen, Miss Emily Aron, Mrs Joanne Bates, Miss Hannah Bilston, Mrs Carole Boon, Mr Stephen Clark, Miss Elizabeth Coleman, Miss Natasha Collings, Miss Wendy Collins, Miss Emily Cook, Mrs Hannah Corcoran, Dr Susie Coyle, Miss Rebecca Dale, Miss Suzannah Dangerfield, Mr Michael Day, Miss Adele Devonshire, Mrs Jenny Eaves, Mrs Cathy Ellis, Miss Nicola Evans, Mrs Naomi Forbes, Miss Victoria Gilbey, Mr Jason Gillingham, Miss Laura Gravestock, Mr Richard Hall, Mr John Harris, Ms Dunia Hatuqa, Mr William Holden, Miss Carly Jefferies, Miss Laura Jennings, Miss Victoria Kelly, Mr Nicholas Marchant, Miss Clare May, Miss Katherine McCombie, Miss Shona McCombie, Miss Natalie McCurach, Miss Jenna McGuinness, Mr Peter Middleton, Miss Leanne Moses, Mr Colin Nisbet, Mr Michael Poulton, Miss Liz Powell, Miss Nicola Rohmann, Miss Rachel Sanderson, Mr Richard Sandifer, Ms Catherine Sellars, Miss Lorraine Simpson, Mr Gregory Slack, Miss Carly Smith, Mrs Lindsay Spink, Dr Nina Sraj, Mr Ian Stewart, Miss Lenka Sukenikova, Miss Helen Ward, Mr Anthony Wileman, Mr Jonathan Williams, Mrs Li-Lian Williams, Mr Ryan Wilson-Parr

### UPGRADES TO ASSOCIATE MEMBERSHIP

Miss Fiona Baker, Miss Lucy Besson, Miss Hannah Bilston, Miss Lucy Blades, Miss Katie Burrough, Mr George Burton, Miss Tanith Cook, Miss Mary Davies, Miss Susannah Dickinson, Ms Charlotte Durkin, Mr James Faulconbridge, Miss Rachael Ford, Dr Jessica Frame, Mr Daniel Free, Mr James Goodrum, Mr Christopher Hill, Miss Rebecca Huxham, Mr Jonathan Jackson, Miss Sarah Lynes, Miss Hazel Marsh, Miss Sarah Muddell, Ms Una Nealon, Miss Mai Nielsen, Miss Rebecca Northey, Miss Samantha Patrone, Miss Sarah Proctor, Mr David Prys-Jones, Miss Nicola Pyle, Miss Amy Roberts, Miss Fiona Ross, Mr Liam Soden, Dr Polly Spencer-Vellacott, Miss Theresa Stewart, Miss Catherine Taylor, Miss Janet Watson, Mr Nicholas White, Mr Antony Witts

### UPGRADES TO GRADUATE MEMBERSHIP

Mr Richard Ayre, Mrs Helen E Burley, Mr Martin Ineson, Miss Laura J Price, Mr Luke Roberts, Mr Steven Roe, Mr Davide Thambithurai

# Forthcoming Events

## IEEM Conferences

DATE	EVENT	LOCATION
15 June 2011	Summer 2011 Conference - Biodiversity and the Big Society	London
2 - 3 November 2011	Autumn 2011 Conference and AGM - Tools for Rebuilding Biodiversity	Liverpool

For more information on conferences please visit: [www.ieem.net/conferences.asp](http://www.ieem.net/conferences.asp)

## IEEM Training Workshops

4 July 2011	Reptile Identification, Survey and Handling	Exeter, Devon
6 July 2011	Invasive and Non Native Flora	Swansea, Wales
22 - 24 July 2011	Working with Crayfish Stage 1	Malham, Yorkshire
27 - 29 July 2011	Working with Crayfish Stage 2	Malham, Yorkshire
28 July 2011	Grasshopper Identification	Pulborough, West Sussex
1 August 2011	Fern and Horsetail Identification	Cleeve, Bristol
11 August 2011	Introduction to Freshwater Crayfish Ecology and Survey Methods	Plantsbrook Local Nature Reserve, Birmingham
2 September 2011	Using the Vegetative Key to the British Flora	Southampton, Hampshire
3 - 4 September 2011	Outdoor First Aid	Keswick, Cumbria
7 - 8 September 2011	Otters: Survey and Mitigation	Melrose, Roxburghshire
13 September 2011	Dormouse Ecology and Conservation	Bideford, Devon
14 September 2011	Introduction to Bats	Bury St Edmunds, Suffolk
15 September 2011	Phase 1 Habitat Survey	Bury St Edmunds, Suffolk
19 September 2011	Freshwater Invertebrates: Identification and Survey	Shrewsbury, Shropshire
3 October 2011	Stonewort Identification and Ecology	Oaksey, Wiltshire
3 October 2011	Water Vole Ecology	Lifton, Devon
4 - 5 October 2011	Water Vole Conservation and Development	Lifton, Devon
5 October 2011	Field Signs for Water Voles	Lenzie, East Dunbartonshire
6 - 7 October 2011	Water Vole Conservation and Development	Lifton, Devon
7 October 2011	Introduction to NVC Survey	Guildford, Surrey
12 October 2011	Hazel Dormouse: Handling and Survey Techniques for Ecological Consultants *** NEW ***	Wye Valley, near Monmouth
12 October 2011	Introduction to Peatland Restoration	Bishopbriggs, East Dunbartonshire
18 - 19 October 2011	Otters: Survey and Mitigation	Alresford, Hampshire
27 October 2011	Surveying for Bats and Development	Croydon, Greater London
9 November 2011	Badgers: Survey, Exclusions and Mitigation	Motherwell, North Lanarkshire
16 November 2011	Introduction to Ecological Consultancy	Near Polegate, East Sussex
23 November 2011	Winning Approaches	Basingstoke, Hampshire
25 November 2011	Winter Tree Identification	Dorking, Surrey

For the full list of workshops and more information please visit: [www.ieem.net/workshops.asp](http://www.ieem.net/workshops.asp)

## IEEM Geographic Section Events

8 June 2011 3.45 - 7.00 pm	South West England Section Event - Steart Coastal Management Scheme (joint IEEM-CIWEM event) *** FREE EVENT ***	Bridgwater, Somerset
14 June 2011 6.30 - 8.30 pm	East of England Section Event - Visit the most extensive, species-rich fen site in the Broads *** FREE EVENT ***	Sutton Fen, Stalham

For more information on IEEM Sections please visit: [www.ieem.net/geographicsections.asp](http://www.ieem.net/geographicsections.asp)