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INTERNATIONAL WETLANDS – ECOLOGY ON THE FRONTLINE

Fellows Lecture – 2001, Torquay
Conference

Phillip J. Edwards FIEEM

I very rarely give talks at conferences – but tonight I am very honoured to be speaking to you. Unlike previous Fellows' Lectures, I do not offer you any pearls of wisdom, ecological or otherwise, for I am not yet a wise man; nor do I offer you any deep insights into improving methodologies or techniques, for I will never be a professor nor do I have such knowledge at my disposal to impart to you. I am indeed like most of you – a humble ecologist practising his profession to make a living and to try and make the world a better place for the generations to come. My only difference is that now I ply my trade beyond the shores of England's green and pleasant land, beyond the hills and glens of bonny Scotland, and away from the Celtic mists of Wales and Ireland – all places where I used to work. It is possible that I may be the only UK-based IIEEM member earning his living wholly overseas. As such, at previous IIEEM conferences, I have received much interest in the work that I do, so it is my intention tonight to take you on a brief journey to distant lands and show you some of the places where I have worked, some of the difficulties faced when working overseas, and some of the types of overseas project that ecologists play a role in – all with an emphasis on wetlands.

My title for this evening - International Wetlands – Ecology on the Frontline – has several meanings

- Many wetlands are at the frontiers of our knowledge;
- Wetlands are on the frontline in the fight for conservation and development and sustainable use;
- Wetlands cross political divides, indeed they often form international boundaries; and
- the places where I often work are or have been literally the frontline – the locations of war or economic chaos.

This is where I work – countries such as Bosnia and Herzegovina, Cambodia, North Korea (Democratic Peoples' Republic of Korea (DPRK)), Mongolia, Russian Far East, Belarus, Vietnam, Azerbaijan, and Georgia.



Figure 1 : Shelled bridge, Highway 6, Kampong Chamm, Cambodia.

You may by now be wondering why an ecologist should want to work amongst such ruin and hardship. Well every coin has two sides and in these countries there are some extraordinarily rich, diverse, and beautiful places.



Figure 2 : Pripyat Marshes, Belarus.

So let me start by giving you a summary of the types of work I am involved with and some examples. Basically, I deal with three main types of project

1. Commercial

- EIA for a 1,700km 48-inch oil pipeline in Azerbaijan, Georgia and Turkey;
- environmental performance auditing for a US\$580 million water supply dam in Malaysia; and
- ecological assessment on an extension to a power station in Hong Kong.

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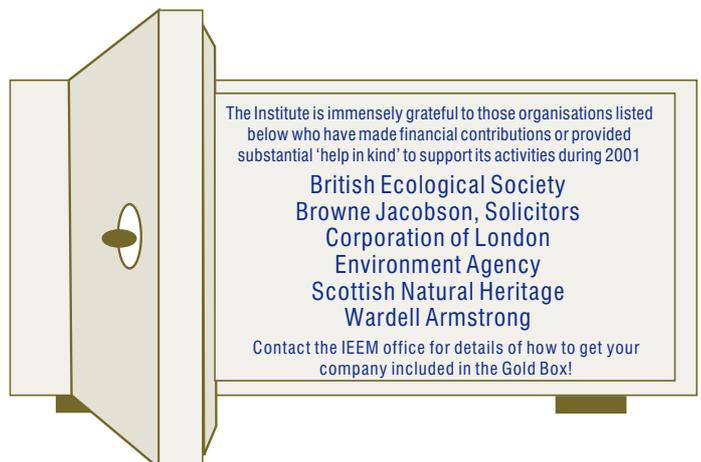
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It looks as though the campaign to remove the Taliban from Afghanistan and to bring Mullah Omah and Osama Bin Laden and the El Quaida network to account will be successful. This being so no doubt the political standing of George W. Bush will, in the recent tradition of leaders associated with successful military campaigns, probably enjoy an extended honeymoon. But the danger is that the other issues, previously raised in this column will be swept aside in the euphoria. These are in broad terms the attitude of the Bush Administration to the environment nationally and internationally and more particularly to climate change in the post Kyoto era. Also important is the attitude to some of the Clinton measures such as the establishment of substantial areas of wildlife conservation on Government lands, the exploitation of oil in Alaska and looking forward to the Rio plus 10 meeting in Johannesburg next September.

A recent edition of *In Practice* ran a report on part of the proceeding of the IUCN Congress in Amman and the papers from this conference have been gradually appearing. One such publication was the 110+ list of resolutions passed by the majority of those present. In a substantial number of these resolutions the US took no part. An explanation of this approach was provided at the end of the resolutions and recommendations booklet and it dealt with two main aspects, firstly how the process of submission of resolutions works, the main point being that there is not really any opportunity for prior discussion of these issues before the Congress and secondly, the approach of the US itself. There are two paragraphs which should cause concern – *We have also come to the conclusion that there are some types of resolutions on which it may not be appropriate for us as a government to engage or negotiate. Among these is a large group of motions directed primarily to a single government or group of governments on national, bilateral or regional issues. We welcome and take seriously the interest of IUCN members in important national and regional issues such as the conservation of the Mekong delta, mesoamerica and parts of Africa, but we believe that responses to these motions are best left to the country or countries concerned. We will not take a position as a government on such motions except as they are directed at the US Government. In this case we will provide a statement for the record to help clarify the issues raised and provide our perspectives.*

A second group of motions are those focused on global issues that we agree are important but are topics of ongoing intergovernmental policy debate in other fora, such as climate change, biotechnology and trade. We respect the interests of members in issues of global concern and we share many of these interests, especially on emerging issues such as illegal logging and invasive species. However we do not intend to take national government positions or particular views on these issues as presented in resolutions here or to vote on the outcome. Is this a genuine attempt by the US to rationalise what can appear to be a somewhat chaotic process? - if so it is to be welcomed. If on the other hand it is yet further evidence of an unwillingness to get involved in anything except where the immediate interests of the US are threatened it would be sad and short sighted - but is perhaps a consistent part of a wider picture.

Jim Thompson



2. Protected areas

- feasibility study for Bjelasnica National Park in Bosnia;
- conservation strategy and management plan for Mai Po Marshes in Hong Kong; and
- the institutional framework for managing Tasek Bera Ramsar site in Malaysia.

3 Development Planning

- Biodiversity and protected area strategic planning inputs to the National Environment Action Plan, Cambodia;
- biodiversity inputs to the Global Environment Facility (GEF) planning phase of the Tumen River Strategic Action Plan; and
- planning the GEF project proposal for the Conservation of Lower Mekong Wetlands.

I shall come on to talk about the latter two development planning projects in due course since these will be the least familiar to most of you, but first let's look at some of the difficulties faced overseas and not normally encountered in the UK.

They fall into two types –

1. Security

Mines and unexploded ordnance are present everywhere in Bosnia – and were used as a de facto system of zoning in a management plan for Bjelasnica National Park. Although we had maps from the Mine Action Centre, there were two problems – one, they estimated that only 60% of the mines sown had been found; and two, the mines weren't always quite where you wanted them to be. Although it has to be said that people do tend to mine the remotest areas and that does help when you want to keep them remote!

But while I make light of the issue, they are real, and deadly, and feared. As an ecologist, and probably more because I am a birder, I tend to wander at will – “what's that bird over there?” In Cambodia you can't do that. It takes only a couple of shouts of “STOP” when you go to step off a road and the sound of dread and horror in their voices makes you learn VERY fast that you cannot wander at will in Cambodia. Ironically, the first place where I found I could wander at will was amongst the dead at the site of the exhumed mass graves of the killing fields from which all mines had been cleared.

Direct attack or kidnapping has, so far, been a problem only in Cambodia. On one job, part of which involved determining the strategy for development of the Protected Areas System of the country, I asked to see the National Park where most of the work had been done to date. “Oh yes”, came the beaming smiles, “we can show you around the outside”. This changed to “Oh no”, and faces of extreme concern when I said I actually wanted to see inside the forest – “but the Khymer Rouge still operate from there”. Nevertheless, after much coaxing we went to see the condition of the forest that was being protected but I had to have a body guard of four soldiers, a radio operator, a Government liaison officer, and a translator to accompany me!

A year later, I did the first nominally post-war ornithological survey of the coast and some inland waterways. Throughout, we had to have military guards. In one place Boeng Chhmaa, we stayed in the floating villages on the frontline in the army posts – not too many survey boats like this in the UK.



Figure 3 : Military boat used for survey at Boeng Chhma, Cambodia 1996.

In others we came much too close for comfort to firefights between the government forces and the Khymer Rouge, and on one memorable occasion, very close to kidnap.

I have been arrested at least four times – once on the Azerbaijan/Armenian cease fire line for taking photos of Iran; once in Mongolia for hijacking a train; and twice in Turkey – once for being identified by the inhabitants of a remote mountain village as a PKK terrorist and finding they had called out an armoured car with a dozen soldiers.

2. Lack of resources

Materials - We get used to technology. In Belarus I was working on a vegetation map and I sent it for enlarging. When it didn't come back within an hour I went to look and found an office full of people in their winter coats, hats and gloves (there was no heating in Government buildings in the winter of 1995 in Belarus because it could not be afforded) all re-scaling maps by hand using dividers! In Cambodia, in the office of the Director of Integrated Coastal Zone Management in the Ministry of Environment – all the shelves were empty – no books, no reports, no papers, nothing except for a plastic bottle of water and an empty glass filed carefully under “Water Resources Planning”. In the DPRK it was even worse – ?? in the director's office of Rajin port there was nothing at all – just a worn out chair, a three-legged desk, and bare electricity wires protruding from the wall.

Knowledge - One of the main constraints faced by ecologists in developing countries is that there are no field guides. A small but crucial problem. A wonderful project initiated by Tony Whitton at the World Bank has sought to redress this by producing local language guides to various taxa in many Asian countries.

Survey methodologies are often suspect. For example, in China, the Ministry of Forestry is undertaking a biological survey throughout 11 Provinces. Although the survey is systematic in approach and huge in coverage (3,300 2km x 100m survey plots in Jilin Province alone), and it is attempting to collect quantitative data, no attempt has been made to control for variation arising from season, time of day, weather, or length of survey period, and although trained biologists are apparently undertaking the work, they are being asked to identify and count species from all taxa at the same time in all habitats - something very few Western ecologists would claim to be capable of. Therefore, the scientific result will be that some information may be gleaned on species' distributions, but the quantitative component will be questionable.

Human resources – There is generally a lack of trained people in most developing countries but it seems worse in environmental fields. Environment is not seen as being sexy - computers and finance pay more money and carry much more prestige, hence many government civil servants do not want to be working in environment. They hate going on field trips and tend to wrap up totally to avoid a suntan and be branded as country folk – but consequently they get to see nothing.

They say that audience participation is important, so please will you stand. I'm going to ask you a series of questions – if any one applies to you please sit down. If you are aged under 20 or over 50, please keep standing throughout.

Do you wear glasses? If so please sit down.

Do you speak a foreign language? If so please sit down.

Are you a teacher? If so please sit down.

Do you hold a university degree? If so please sit down.

Now look around you and see how many people are still standing. [3 people out of about 100 were still standing.] Remember why you sat down.

In Cambodia, tragically there are virtually no human resources. For those of you sitting down just now, if you had been in Cambodia during the late 1970s, you would have been killed. The Khmer Rouge killed all the intellectuals for the reasons I just gave you. In 1995 when I first went there, there was nobody in the government ministries aged between 20 and 50. Think about the repercussions for trying to run a country like that for a moment.

Let us take a look at two of the wetland development planning projects mentioned earlier.

Tumen River Economic Development Area

The Tumen River forms the boundary between Russia, China and the DPRK.



Figure 4 : The Tumen River – land foreground and left is Russia, in the centre is China, and right and background is the DPRK.

The provinces bordering the river, plus the eastern steppe of Mongolia are the site of perhaps the biggest development programme in the world with the potential to attract billions of dollars of investment. New manufacturing industries, mining, and energy developments are all identified.

Since 1992 the United Nations Development Programme (UNDP) has been assisting government initiatives and coordinating policies and actions for economically and environmentally sustainable development of the region.

In December 1995 the five countries concerned signed a Memorandum of Understanding on Environmental Principles with the aim of reinforcing regional co-operation, conducting environmental assessment studies, and implementing regional environmental mitigation and management plans.

In 1997, as part of a UNDP mission to the area developing the framework for a Strategic Action Plan, I was charged with gathering and assessing information on biodiversity, identifying the key threats in the region, and reviewing the protected area systems of the countries involved. The following is a summary:

Key ecosystems

The area under consideration mostly lies at the boundary of the Amur-Sakhalin/Manchurian bioregions, sub zones of the Boreal and Asian biomes respectively, and further west it falls within the Mongolian bioregion. It encompasses a wide range of ecosystems, many of which are of global significance for their biodiversity or for the existence of particular globally-threatened species/sub species. Southern Primorskie Krai supports more Russian Red Data Book species than any part of the Russian Far East. Key ecosystems are:

- temperate mixed coniferous and broad-leaved forests, particularly Korean Pine *Pinus koraiensis*, with high levels of endemism amongst their plants and insects. There are small patches of the unique Black Fir *Abies holophylla* forest type present. The forests support 53 species of mammal including Amur Forest Cat *Felis euphilura*, Brown Bear *Ursus arctos*, Himalyan Black Bear *U. tibetanus ussuricus*, Goral (horned goat) *Nemorhaedus caudatus*, Lynx *Lynx lynx*; 280 species of birds including many globally-threatened and endemic species, e.g. Blakiston's Fish-owl *Ketupa blakistoni* (world population <500 pairs), Chinese Merganser *Mergus squamatus* (world population c.1,200 pairs); and over 2,000 species of plants including many globally rare species, e.g. Ginseng *Panax ginseng* and *Aristolochia mandshuriensis*.
- coastal wetlands meeting Ramsar Convention criteria for wetlands of international importance and supporting over 300 bird species including over 30 which are globally-threatened, the most important of which are 10% of the world population of Red-crowned Crane *Grus japonensis* and large numbers of White-naped Crane *Grus vipio*. This wetland complex is one of the most important staging sites on the East Asian/Australasian Flyway;
- marine systems with very high levels of biodiversity supporting several marine mammals and over 2,000 species of marine invertebrates. The highest productivity levels within the Sea of Japan are associated with this area. About 100,000 seabirds breed on more than 30 small offshore islands and 100,000-200,000 waterbirds including many seabirds and sea duck which breed further north, over-winter in the bays and along the coast. Globally-threatened raptors such as Steller's *Halieeatus pelagicus* and White-tailed Sea-eagles *H. albicilla* also winter along this coast; and
- the steppe of eastern Mongolia which represents the last extensive area of intact temperate grasslands in the world. It supports up to 1 million migratory Mongolian Gazelle *Procapra gutturosa* representing one of Asia's largest remaining wildlife populations and, along with the wildebeest and caribou migrations in Africa and North America respectively, represents one of the three last major migrations of ungulates on earth. Twenty-four other mammalian species occur

including Wolf *Canis lupus*, Corsac Fox *Vulpes corsac*, Steppe Polecat *Mustela eversmanni*, Siberian Marmot *Marmota sibirica*, and Daurian Hedgehog *Erinaceus dauricus*. Around 100 species of bird breed on the eastern steppe including the globally-threatened Great Bustard *Otis tarda* and Demoiselle Crane *Anthropoides virgo*, and other globally-threatened species are present e.g. Asiatic Grass Frog *Rana chensinensis*.

Key globally-threatened species/subspecies include:

- **Amur Leopard** *Panthera pardus orientalis*, the most northerly race of the leopard, is recognized internationally as a critically endangered subspecies and listed on Appendix 1 of CITES. The most recent estimate (1990-92) is for a world population of 60 animals in the wild inhabiting the trans-border forests of southern Primorskie Krai, Russia (30-36), Jilin Province, China (15), and the ROK (5-10). The number of animals, if any, in the DPRK is unknown. Approximately 196 animals are held in captivity by 60 zoos around the world. The single continuous population of Amur Leopards in Russia/China was fragmented into three in the first half of this century, and as of 1970, two of these have apparently disappeared. Cub survival has almost halved over 18 years (1972/73-1990/91).
- **Siberian Tiger** *Panthera tigris altaica* is the largest of the five remaining subspecies of tiger and hence is the world's biggest terrestrial carnivore. It is recognized internationally as an endangered subspecies and is listed on Appendix 1 of CITES. The most recent population estimates in 1996 place the world population at 342-393 animals inhabiting the trans-border forests of southern Primorskie Krai, Russia (330-370), and Jilin Province, China (12). The number of animals, if any, in the DPRK is unknown. This population appears to be relatively stable or growing (1984-85 census estimated 250 animals) having recovered from a low of about 50 in the early 1940s.
- **Cranes**, five species of which occur in the area, two of significance - Red-crowned Crane (continental migratory population of c.1,200; Japanese resident population c.600) and White-naped Crane (world population c.5,500). Crane species appear to comprise two separate geographical populations, one breeding in the trans-border wetlands of eastern Mongolia/Russia/China and migrating and staging at wetlands through eastern China to over-winter in the Yangtze River basin and at Poyang Lake in Jiangxi Province, China; and another breeding in the southern part of Amur Oblast, Russia, and migrating and staging through the Tumen wetlands, North and South Korea, to over-winter at Arasaki on Kyushu, southern Japan. On both routes, the breeding and wintering grounds are protected, but many of the important staging areas are not.
- **Ginseng** is recognized internationally as an endangered species and is being considered for listing under CITES. Its original distribution covered parts of Liaoning, Jilin and Heilongjiang Provinces, China; the DPRK; and Primorskie and Khabarovsk Krai, Russia. However, it is now practically extinct in the wild in China and Korea, despite it being cultivated in large quantities in these countries. The existing range is represented now by two main populations - the southern part of the Sikhote-Alin Mountains in Primorskie; and the Laoyeling Mountains along the Primorskie, Russia/Jilin, China border.

So what are the key threats to the environment in this region?

Pollution

The most significant current issue and the biggest future threat to the region's biodiversity is water pollution from heavy metals, phenols and vastly reduced levels of dissolved oxygen. This

- has caused decimation of fish species and numbers in the Tumen River including the possible extinction of three endemic species and the collapse of a traditional fishing industry within the river;
- threatens the unique and species-rich marine communities in Peter the Great Bay; and
- threatens the economically valuable fishing and mariculture industries in Russia and the DPRK - the most important and valuable species of which are echinoderms which are exported to Japan at US\$25,000/tonne, and a giant gastropod sea-snail which are exported to ROK for US\$4,000/tonne.

Military-related

The remains of military installations are widespread throughout southern Russia and eastern Mongolia. No information is available on these but there is a potential for soil contamination by fuel oils and unknown chemicals. Near Vladivostok on the coast there is a nuclear submarine breaking yard, where it is reported a number of nuclear reactor power-plants for these ships are stored. Pollution by radionucleides is reportedly a possibility but no assessments have been possible.

Fire

Fire is a major problem in the region. Increased frequency of fires and the decreased response in fighting them is making things worse. Repeated burning of forest areas incinerates most of the understorey species and differentially burns conifer trees more than broad-leaved species. Frequent burning has resulted in forests with almost no understorey vegetation, and in extreme cases has led to the conversion of forest to grassland. In southern Russia and eastern Mongolia, 40% of the land now burns every year, and in some years this may reach up to 80%. The causes of fire appear to be from sparks from trains along the railways, and from farmers burning the dead grass and stubble from their fields to promote new growth for their livestock, and the growth of a fern considered a food delicacy. Inadequate or no fire prevention measures are taken, e.g. there are no fire breaks along the railway, and the problem has worsened in recent years since the withdrawal of much of the military which used to help fight the fires.

Conversion of wetlands

Despite the acknowledged beneficial uses of wetlands to humans, loss of wetlands is in evidence in China and the DPRK. In China, the Jingxi Wetlands alongside the Tumen River had in part been converted into a large reservoir through the construction of a barrage and in part had been drained almost to the banks of the remaining lakes for use as rice fields. The waters of the reservoir are now used for irrigation of cropland and as a large-scale fish farm.

In the DPRK, much of the wetland associated with the Sonbong Lakes have been converted to agricultural use. With the acute food shortages within the country in 1997, many of the remaining marshes had recently been drained and converted to arable fields growing maize and potatoes. That the soil

was fertile was evident from its high organic content, but that it was unsuitable for arable crops was also evident from those areas nearby which had been converted a few years earlier and which now comprised mostly infertile sand.

Overgrazing

In Mongolia, over-grazing of grasslands is a problem. The area of grazing land decreased by 7 million ha (5%) between 1970 and 1994, and the Botanical Institute of the Academy of Science estimates one third of grazing land (42 million ha) has been overgrazed through poor management. Plant diversity has fallen by as much as 80% in areas near towns with knock-on effects for invertebrates.

Future threats from economic development

The biggest future threat comes from the development of further heavy industrial plants along the Tumen River extracting more water and returning new effluents, thereby adding to the already excessive pollution loads. The demand for raw materials will also rise. Existing mining operations have been significant contributors to the degradation of the environment, e.g. in the eastern provinces of Mongolia, prospecting activities from before 1995 have not been restored. There are believed to be large deposits of coal, polymetal ore (tin, silver, copper, etc.) uranium, fluorspar, and probably oil and gas beneath the eastern steppe.

Concern has also been expressed over new infrastructure developments. Two examples:

- a new railway is proposed through eastern Mongolia to link with new port developments in Russia. The existing Ulaanbataar-Beijing Railway has disrupted the migration of Mongolian Gazelles and, unless carefully designed to mitigate this problem, the new railway could cause further significant disruption.
- an international airport is proposed on the Sonbong Lakes— inappropriate here on two counts - safety and environment.

Protected Areas

Finally, a quick look at the selection criteria of protected areas.

Unlike in Europe and North America where the Protected Area Systems attempt to conserve the best representatives of all habitat types, or in Africa where the presence of huge concentrations of large game were initially protected for hunting and later for tourism, those in NE Asia have been driven almost solely by the goal of protecting rare species, particularly:

- protection of forests for big cats; and
- protection of wetlands to conserve cranes.

While the approach of using key or flagship species to protect large areas of habitat upon which they depend is recognised internationally, and often with a high degree of success, it is unusual to find neighbouring countries basing their efforts so exclusively upon so few species. This has advantages and disadvantages. The advantages are:

- large areas of habitat important for many other species, many of them rare, have been conserved; and
- the ground work for future trans-border international reserves and institutional cross-border cooperation has been laid.

The disadvantages are:

- many of the Protected Areas are too small for the key species they are trying to protect because of a poor understanding of their ecology, and consequently most of the rare species' populations still inhabit unprotected areas;
- little consideration as been given to the ecological isolation of Protected Areas;
- the Protected Area Systems do not cover a representative selection of habitats;
- many smaller rare species have been overlooked; and
- there is little protection for biologically-rich areas under threat from development and fragmentation but which lack the flagship species.

Proposed Protected Areas

China, Mongolia, and Russia each have a number of official proposals underway to extend the Protected Area System of the region.

- In Jilin Province, China, three Provincial Nature Reserves are proposed totalling 121,000ha to protect two wetland sites important for Cranes, and a large area of forest adjoining the Russian border to act as a reserve for Tigers.
- In Russia, the main area proposed is the Khasan Wetlands, important for waterbirds.
- In eastern Mongolia, one Strictly Protected Area and three Nature Reserves are proposed primarily to extend the area of steppe which is protected, especially for Mongolian Gazelles.

Development of an overall Strategic Action Plan for the area is now underway by UNDP, and environment, sustainable development, and an expanded and improved protected area system are central factors in it.

The Wetlands of the Lower Mekong Basin

From North East Asia, let me turn now to South East Asia and the second of the two development projects I wish to describe tonight – The Conservation of Wetlands in the Lower Mekong River Basin. This project developed a proposal to the Global Environment Facility (GEF) amounting to US\$ 31 million. It was initiated by IUCN and UNDP to tackle some of the root causes of the environmental problems that beset the area, and if passed by the GEF Council, it will be implemented during 2002 to 2007.

A word about GEF funding. GEF funds can be used only to tackle the root causes of problems, and to fund only the incremental cost associated with the global benefits. Thus, the current baseline contributions and the national contributions which will provide national benefits need to be identified and costed separately from those actions providing the global benefits – the incremental cost. Co-funding from bi-lateral and multi-lateral development agencies is also required and must be obtained.

The Mekong River is one of the great river systems of the world. Rising in the Tibetan Plateau and disgorging into the South China Sea some 4,800 kilometres later, it is ranked as the twelfth longest of the world's rivers. The seasonal variation in water level is the source of the productivity of the system. Wet season river levels are up to 8-10 metres higher than dry season ones, creating a rich and extensive series of wetlands. The Tonle Sap River is one of the very few in the world to flow in two directions. The flood pulse

from the Mekong River reverses its flow in the wet season and inundates the Tonle Sap Lake which expands in area from around 300,000 hectares to 1.2 million hectares at peak flood height, inundating over 500,000 hectares of forest. As the water level of the Mekong River drops, the Tonle Sap River resumes its normal direction of flow and discharges the lake into the Mekong Delta.

The biodiversity of the Mekong River Basin is immense, and of truly exceptional significance to international biodiversity conservation even in comparison with other parts of tropical Asia. The river and its numerous tributaries, backwaters, lakes, and swamps support many unique ecosystems and a wide array of globally-threatened species. The diversity of the river fauna itself is surpassed only by that of the Amazon and the Congo. This biodiversity also forms the main natural resource for a population of 55 million people living in the Lower Mekong Basin. Despite the rapid economic advances made over the last decade, the national economies of the Lower Mekong states are based primarily on agriculture and natural resources. Over three-quarters of each of the populations of Cambodia, Laos, Thailand, and Vietnam are rural with livelihoods reliant almost entirely on subsistence farming, fisheries, wildlife, forest products and plant resource utilisation.

The Mekong has a wide variety of unique riparian ecosystems. Four examples:

- **Upland tributaries:** are fast-flowing rivers rising in the mountains and passing through dense stands of fringing gallery forest containing *Dipterocarpus turbinatus*, *D. alatus* and *D. costatus*. Most of the tributaries on the east side of the Mekong rise high in the Annamite Mountains and plunge steeply towards the Mekong Valley. Caves and waterfalls are common in the limestone karst. Little is known of the aquatic biodiversity inhabiting these areas, but the limited surveys conducted to date indicate over 53 species of fish are endemic to single sub-basins of the Lower Mekong Basin.
- **Lowland river channels:** comprise the main course of the Mekong and its major tributaries. Exposed sandbars and rocks are widespread. In the dry season the rivers are broad, relatively slow-flowing, with a series of deep pools vitally important for dolphins and seasonally-quiet floodplain fish species but, in the wet season, water levels rise 8-10m, the currents become torrential, and the remnants of a unique riverine forest, dominated by *Dipterocarpus alatus*, *D. dyeri*, and *Hopea odorata*, flood. This forest is so little known that many species are still not named. The trees exhibit two strategies for dealing with the floods – growing near-horizontally beneath the water, or developing structural supports on the downstream side of their trunks



Figure 5: Riverine forest, Stoeng Treng, Cambodia.



Figure 6: Riverine forest, Stoeng Treng, Cambodia.

- **Floodplain wetlands:** include seasonally-inundated lakes, swamps, and riparian forest. The inundated forest, most famous around Lake Tonle Sap, is dominated by the trees of the genera *Barringtonia* and *Diospyros* which survive four months of inundation. Woody species, laden with fruits and seeds at the time of inundation, provide food for 34 species of fruit-eating fish found in the Mekong River. Over 140 species of fish have been recorded in Lake Tonle Sap. The lake's productivity is prolific, making a substantial contribution to the estimated 400,000 tonnes annual fish production in Cambodia.
- **Deltaic formations:** occur from where the Mekong River begins its separation into many channels downstream of Phnom Penh. On the Cambodia-Vietnam border is the "Plain of Reeds", most of which is now under rice cultivation, but some natural areas remain with *Nelumbo nucifera*, *Nymphaea nouchali*, *N. pubescens* and *N. tetragona*, and wet grass plains dominated by *Elocharis dulcharis*, *E. ochrostachys* and wild rice *Oryza rufipogon* (one of the few remaining sources for the natural stock of this species). In this area, there are a number of patches of the former riverine forest habitats of *Melaleuca* associated with *Syzygium* sp., *Elaeocarpus hygrophilus*, *Ficus microcarpa*, and *Cassia grandis*, often on peaty deposits.

Important taxa in the Mekong Basin include:

- **Mammals:** Irrawaddy Dolphin *Orcaella brevirostris* is believed to be Critically Endangered globally, but is classified as Data Deficient. The population remaining in the Mekong is estimated at less than 100 individuals, mostly between Phnom Penh and the Khone Falls in southern Lao and the Xe Kong River. Most of the mammals associated with wetlands are now threatened including the Endangered Wild Water Buffalo *Bubalus arnee* and Lowe's Otter Civet *Cynogale lowei*, the Vulnerable Eld's Deer *Cervus eldi*, Hairy-nosed Otter *Lutra sumatrana*, and Smooth-coated Otter *Lutrogale perspicillata*, and the Near-threatened Fishing Cat *Prionailurus viverrinus* and the Oriental Small-Clawed Otter *Aonyx cinerea*.
- **Birds:** The wetlands of the Lower Mekong Basin support 14 globally-threatened bird species, namely the Critically Endangered Giant Ibis *Pseudibis gigantea*, re-discovered in 1993 along the Xe Kong and Mekong Rivers in southern Lao PDR, the globally Endangered Greater Adjutant *Leptoptilos dubius*, White-shouldered Ibis *Pseudibis davisoni*, White-winged Duck *Cairina scutulata*, Bengal Florican *Eupodotis bengalensis* and Nordmann's Greenshank *Tringoides guttifer*; the globally Vulnerable Spot-billed Pelican *Pelecanus philippensis*, Lesser Adjutant

Leptoptilos javanicus, Milky Stork *Mycteria cinerea*, Greater Spotted Eagle *Aquila clangula*, Green Peafowl *Pavo muticus*, Masked Finfoot *Heliopais personata*, Black-bellied Tern *Sterna acuticauda*, and Indian Skimmer *Rynchops albicollis* and eleven globally near-threatened wetland bird species. Lake Tonle Sap holds the largest breeding colonies of large waterbirds in Asia.

- **Reptiles:** Siamese Crocodile *Crocodylus siamensis* is Critically Endangered globally and is listed on Appendix I of CITES. It was formerly widespread throughout the Lower Mekong Basin but has declined drastically due to excessive hunting and habitat destruction. These populations, believed to be confined to southern Lao PDR and Cambodia, are of extreme global importance as the last wild populations. Local, but unconfirmed reports exist for the presence of the Data Deficient, but probably Critically Endangered, False Gharial *Tomistoma schlegelii*. Over twenty species of turtles occur in the Lower Mekong Basin, ten of which are listed in the Red Data Book including the Chinese Three-striped Box Turtle *Cuora trifasciata* which is Critically Endangered and five other species listed as Vulnerable.
- **Fish:** Fish diversity is amazing. Up to 1,300 species of fish may be present in the Lower Mekong Basin, and one systematic taxonomic study has identified 456 species of which 179 (40%) are endemic and 53 species (11%) are known from only a single sub-basin, demonstrating a high level of local endemism. Two species are Critically Endangered globally, Leaping Barb *Chela caeruleostigmata* and Dwarf *Botia Botia sidthimunki*. The migratory Giant Catfish *Pangasianodon gigas* and Jullien's Carp *Probarbus jullieni* are Endangered globally, as are the Golden Arowana *Scleropages formosus*, and an endemic freshwater herring *Tenuulosa thibaudeaui*. The Giant Catfish is believed to migrate over 1,000 kilometers each year from around the Tonle Sap and the Delta to stretches on the Mekong upstream of Vientiane where it is thought to spawn. *Boraras micros*, the world's second smallest fish at less than 12mm long, inhabits swamps of the Mekong flood plain. Also present is a group of marine-type fish species including three large fresh-water stingrays *Himantura chaophraya* (disc diameter 2.5m), *H. oxyrinchus* and *Dasyatis laoensis* (both up to 1m), and freshwater sharks (e.g. *Carcharhinus leucas*). An endemic species called *Luciocyprinus striolatus*, which can weigh up to 60 kg, is purported to have been seen taking small monkeys close to riverine channels and associated vegetation.
- **Invertebrates:** The wetlands of the Lower Mekong Basin also contain a wealth of diversity of other groups. Limited surveys of molluscs have so far identified a rich biodiversity with a high level of endemism - of 160 mollusc species identified in 500km of the Mekong and its Mun tributary, 116 species (72%) are endemic. An as yet unidentified freshwater jellyfish *Moerisia sp.* has been found just south of Khone Falls, and a diverse range of invertebrate fauna including sponges are expected to be identified.

Threats

There are a range of threats to wetland biodiversity in the Mekong River and a full root cause analysis is given in Figure 7.

These threats can be categorised as:

- habitat destruction and degradation;
- loss of ecosystem integrity; and
- depletion of species abundance and diversity.

To use the latter as an example, the project planning team identified the immediate causes as follows. Over-harvesting of plant and animal products is widespread. Guns remain prevalent after recent conflicts and a wide variety of other weapons and traps are used for hunting. In Laos, most animal protein consumed in rural households comes from captured wildlife, and wildlife markets flourish. In addition, there is a massive organised illicit movement of live animals and parts of dead animals into neighbouring lands particularly for traditional medicine in China and for food in Thailand. This has brought many species to the brink of imminent extinction. The situation is exacerbated by the widespread use of destructive harvesting practices which destroy non-target species. These include the use of explosives to collect all the fish from a specific area; electro-fishing (use of an electric charge to kill all aquatic organisms within a selected range); use of small-mesh nets (thereby taking immature stock); and tree-felling (to remove arboreal wildlife or allow easy gathering of fruit). Loss of ecosystem composition is further heightened by the introduction and spread of alien invasive species.

The root cause of this is the lack of options for local people over the use of natural resources by local communities and the proposed intervention is to set up four demonstration sites, one in each country in a different type of wetland habitat, to demonstrate methods of sustainable management of natural resources combined with poverty alleviation.

This is not the forum in which to examine the interventions in detail, but a GEF project proposal requires that for each intervention, all component parts, objectives, outputs, inputs, costs, management and technical responsibilities need to be elaborated, and agreed. Extensive consultation with all parties at all levels is necessary and Governments must sign up to the project plan prior to its submission to GEF. The project outlined here has taken 21 months to develop and is now before the GEF Council.

Ladies and Gentlemen, I hope I have given you some insight into the exciting yet daunting opportunities that can be available to ecologists working overseas, and I urge those of you who are motivated to act. To paraphrase Lord Kitchener's old call to arms "The world's wetlands needs you" – but so do its forests, grasslands, and other wild places. It needs the skills and the dedication that the members of this institute can bring to the problems that the world's wild places face. Above all it needs your professionalism.

Phillip Edwards is Director of Xenus Ecology.

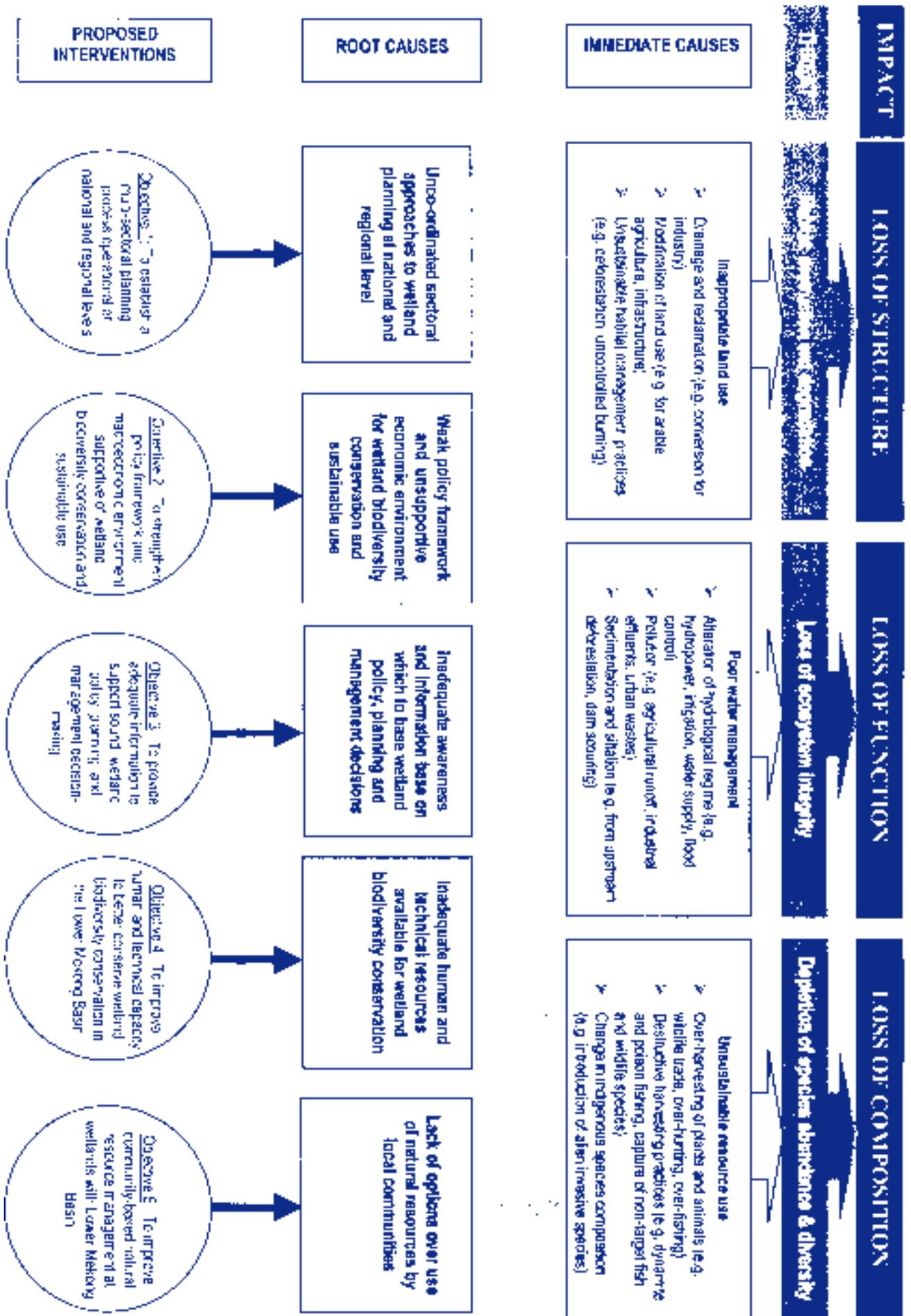


FIGURE 7 : ROOT CAUSE ANALYSIS OF THREATS TO WETLAND BIODIVERSITY IN THE LOWER MEKONG BASIN

SUSTAINABILITY IN LONDON

Ken Livingstone, Mayor of London

Editor's Note: This speech was delivered at the launch of the London Sustainability Exchange on Tuesday, 13 November. IEEM is very grateful to the Mayor for kindly agreeing to it being reproduced in In Practice as the ideas outlined are a significant synthesis of approaches being developed towards sustainability in London. In the unavoidable absence of the Mayor on that occasion, the speech was read by Dr David Goode, MIEEM Head of Environment, GLA.

The launch of the London Sustainability Exchange is an important occasion and I am glad to be able to provide an indication of the way the GLA is developing its policies in this field.

The GLA has a duty to take account of sustainability in everything we do and to contribute to the achievement of sustainable development in the UK. This means finding long-term sustainable solutions from which Londoners, businesses and the environment will all benefit.

I see London as offering a huge opportunity in this respect. If we can't make London and similar world cities sustainable, then what hope do we have? Over half the world's population now lives in towns and cities. We are rapidly transforming ourselves into an urban species.

Although London was the first city to reach a population of one million in 1800, there are now around 300 cities with over 1 million inhabitants. By 2020, two-thirds of the world will live in cities, with much of the rest depending on urban markets for their economic survival. *There will be no sustainable world without sustainable cities.*

Finding ways of making modern cities vibrant and livable, with sustainable economic growth, whilst at the same time making them self-regulating and reducing their global environmental impact is one of our greatest challenges. Most western cities are inherently unsustainable. They are dependent on vast quantities of resources which we consume every day. Although cities take up only 2% of the world's land surface, we use over 75% of its resources.

The way London functions - its pattern of consumption, resource use, growth and waste production can be likened to a living organism. Using the metaphor of 'urban metabolism' is a useful way of illustrating how London could become more sustainable. We have already heard about the original work on London's ecological footprint by Herbert Girardet which estimated that London used the equivalent of two supertankers of oil each week and discharged 60 million tonnes of carbon dioxide into the atmosphere every year. My draft waste strategy calculates that as a result of our everyday activities we produce 18 million tonnes of waste every year, *most of which is literally wasted*. London's ecological footprint has been estimated to be 125 times the size of the city itself. This means that an area about the size of the entire productive land area of the UK is needed just to keep London going. This footprint is of course dispersed around the world and has ecological impacts in many different ways which are difficult to assess. The GLA is

currently co-funding an updated study of London's ecological footprint which will be completed next year.

One of our problems is that it has not previously been possible or acceptable to address these issues in a way that will result in real change. Instead of these wasteful processes, we need to mimic natural biological systems with their self-regulating processes which eradicate waste. We need to close some of the loops in the urban system - for example, by recycling our waste products and converting the waste stream into useful economic products and thereby developing new businesses and industries.

Viewing London in this metabolic way reveals a positive opportunity. Instead of seeing cities as the source of the world's environmental problems, we can look at them as the most efficient way of contributing to the solutions. To put it simply, it is in cities that the greatest opportunities exist to make the necessary changes towards sustainability. There are enormous potential savings to be made through the economies of scale inherent in higher urban densities, and this lies at the heart of my Spatial Development Strategy - the London Plan.

My strategies aim to make London an exemplary sustainable world city. Most people would say that transport and litter are two of the biggest issues for London's environment, but to move towards greater sustainability we need to probe much deeper.

I have already mentioned the need to divert the waste stream into new products, creating new businesses and employment where it is most needed. We also need to move towards a sustainable energy strategy in London, using energy more efficiently and championing renewable sources. We need to look at new fuels for transport, fuels that are less polluting and don't contribute to ill health, and which reduce London's greenhouse gas emissions.

In September I launched an initiative by Ford to provide a dozen electric cars as a pilot scheme with London firms which is proving very successful. It was good to see this fleet of silent electric cars in the middle of the Lord Mayor's show on Saturday. This is just one of many initiatives promoting new technology. Fuel cells will be next. I will be promoting a major conference on this early next year.

This is why my strategies are particularly exciting from a sustainability standpoint. For the first time, London will shortly have comprehensive plans for waste, air quality, biodiversity and noise. In addition, I have added energy to my suite of environmental strategies. But it is not only these strategies that are contributing in this way. All my strategies address sustainability issues whether they are dealing with economic development, transport, planning or culture. The London Plan will encapsulate all of this and provide an overall vision for long-term sustainability.

I have adopted a set of sustainability principles to aid the development of these strategies and to help appraise them in terms of their contribution towards long term sustainability.

I have also decided to set up a Sustainable Development Commission for London to help develop the long-term vision for London and to ensure that my strategies fully address sustainability. Although the GLA has a duty to promote sustainable development, we will need to work closely with our

partners and stakeholders if we are to achieve real changes. That means many of you here tonight - especially the business community. I see the new commission having a vital role in this respect.

But things are already beginning to happen. New initiatives are emerging which will deliver on economic, social and environmental issues *at the same time*.

The successful London Remade project with £5.4m input from the LDA aims to create new markets for waste, encourage private sector investment and create local employment. It will make more efficient use of natural resources and reduce the amount of waste that ends up in landfill. The emerging London Plan, which aims to cater for London's growth over the next 15 to 20 years, will be accompanied not only by an independent sustainability appraisal, but also supplementary guidance for sustainable construction and design for new buildings. Londoners deserve homes that are energy efficient, reducing the impact on people's fuel bills and on the environment at the same time.

I have also agreed that the GLA will chair the new regional steering group

looking into the impacts of climate change on London. This study will examine the effects on business, health, tourism and wildlife, as well as the very direct economic and social effects of increased flood risk.

So I welcome the birth of the London Sustainability Exchange and I look forward to close co-operation with you in working towards a sustainable future for London. The Exchange will have a key role in disseminating the message of sustainability, championing good practice where it already exists and stimulating it where it is needed. London needs a popular face for sustainability, to make it understandable and appealing so that it becomes part of our everyday lives and activities. We need to be aware of this in every decision we make, in the way we travel to work, or the way we deal with our household rubbish. Influencing lifestyle changes and helping to forge new value systems will be fundamental in helping London to realise its true world city potential as a centre of creativity, communication and education.

I am sure that this new initiative will be a great success and look forward to an exciting partnership with you in the future.

**LONDON BOROUGH OF MERTON
EDUCATION LEISURE AND
LIBRARIES DEPARTMENT
NATURE CONSERVATION
CONTRACT**



Applications are invited from suitably qualified and experienced contractors wishing to be included on a select list of tenderers for the above contract.

The contract will cover the maintenance and enhancement of Sites of Conservation Importance including a number of statutory Nature Reserves within the London Borough of Merton.

The work elements include the maintenance of hay meadows, recently planted woodlands, semi-natural secondary woodlands, native hedges, seasonal ponds, tall herb and ruderal vegetation and unsurfaced footpaths.

The contractor should be aware of the need to maintain and improve where necessary these habitats.

The contract will run for a period of four years commencing on the 1st June 2002.

During the period December 28th 2001, until 1st February 2002, any interested person, body or organisation may inspect free of charge, a specification of the work to be carried out at the Department's Office which is situated on the 9th Floor, Merton Civic Centre, London Road, Morden, Surrey SM4 5DX between the hours of 10.00 a.m. and 4.00 p.m. each day Monday to Friday.

An appointment to visit can be made by contacting Ruth Hutton on 0208 545 3658.

Alternatively a specification will be supplied to interested parties on receipt of a request accompanied by a payment of £50.00.

Any person, body or organisation wishing to be considered for inclusion in the formal tendering process will be required to complete a questionnaire regarding their competence, experience, financial status and other relevant criteria which will be used to assess their suitability to undertake the contract.

Any person, body or organisation wishing to be considered for inclusion in the formal tendering process must also register their interest by writing to:-

Ruth Hutton
C/o The Director of Education Leisure & Libraries
Merton Civic Centre, London Road, Morden
Surrey SM4 5DX

ALL SUCH EXPRESSIONS OF INTEREST MUST BE RECEIVED
ON OR BEFORE FRIDAY 1st FEBRUARY 2002.

AMPHIBIAN PITFALL TRAPPING AT A SITE IN NEWHAVEN, EAST SUSSEX

Barry Kemp

Background

The Ouse Estuary Project is a major conservation project being undertaken by East Sussex County Council at a site in Newhaven. Last year over 1500 Great Crested Newts (*Triturus cristatus*) were caught along with 1300 Smooth Newts (*Triturus vulgaris*), 300 Toads (*Bufo bufo*) and a small number of Palmate Newts (*Triturus helveticus*). The site was also found to have a good mammal population including Weasel, Stoat, Harvest Mice, Pigmy, Common & Water Shrew, Field & Bank Vole. This year an additional 2500 GCN have been removed to safe enclosures as well as nearly 600 Smooth Newts, 550 Toads and over 100 small mammals. English Nature are currently looking to designate the site as SSSI.

Introduction

English Nature have recently produced an excellent publication in the Great Crested Newt Mitigation Guidelines which describes in detail all aspects of GCN mitigation works and should be the first point of reference to anyone working in this field.

This article will concentrate on my practical experience and findings gained from extensive pitfall trapping at one specific site where large numbers of amphibians have been encountered over a two year period.



Great Crested Newts

The Site

The Ouse Estuary at Newhaven in East Sussex lies within the Tide Mills SSSI and consists of 52 hectares of low-lying arable farmland with areas of permanent grassland including areas of MG12. A network of drainage ditches and ponds exists throughout the site.

The area was known to support a small Great Crested Newt population, at the time identified as being based around just two of the ponds. In 1998 a new waste water pipeline was installed across the site but mitigation measures undertaken at the time produced only a handful of GCN.

In April 2000 East Sussex County Council started an ambitious project to convert the site into an area of reed-beds, water meadows, ponds and terrestrial habitats.

Linked to this scheme is the proposed development of the Newhaven Port Access Road.

Licensing

The site is subject to two separate GCN licences. Consultants Baker Shepherd Gillespie hold a DEFRA licence for the area to be developed the west of the site, whilst I hold the Councils' conservation licence (issued by English Nature) for the land to the east of the site.

The mitigation for the development on the western side relies entirely on using the County Council land as the receptor site for all translocated species.

The County Council Scheme

The scheme uses 4447 metres of drift fencing with pitfall traps to remove animals from the areas due to be affected by the habitat enhancements. In addition to this over 4800 metres of ACO one-way fencing have been used to create a total area of 9.3 hectares of safe enclosures around the existing ponds, ditches and terrestrial habitats. All amphibians and any small mammals that fall into the pitfall traps are then released into these enclosures. Any amphibians not intercepted by the drift fencing are able to migrate over the fence to reach their breeding sites unaided.



Great Crested Newt on ACO

Positioning the Drift fencing

No information was available at the start of the project as to where GCN were likely to be found outside of the two previously identified breeding ponds. The arable fields within the project site appeared to offer little or no suitable terrestrial habitat. The banks of the ditches appeared to offer the best foraging and hibernating sites for amphibians, although subject to fluctuations in water levels, especially in the winter. There is a feeling among some ecologists that GCN may overwinter in open fields but this is yet to be confirmed. At this site the fields had previously always been ploughed in November and the effect (if any) of this on the amphibian population can not be ascertained.

Two different fencing layouts were adopted for the site. The drift fencing on the County Council side was positioned largely in open areas of the fields due to be subjected to the habitat enhancements. The drift fencing on the development side was erected along both sides of all the ditches, effectively ring fencing them. After two seasons of trapping both methods have worked equally well with no marked difference in numbers of animals collected.

It soon became apparent that one area to the north of the site was not producing the same numbers of amphibians as the rest of the site. This was a surprise as there were known GCN breeding ponds close by.

To try to address this an additional line of drift fencing with six pitfall traps were installed at 90 degrees to the two existing lines. This had an immediate effect in that 40 GCN entered these traps in a period of less than a month. The total number of GCN entering the existing 21 traps in this area over the two year period totalled only 29.



Pitfall trap

7 days a week

Expect the trapping period to run from late January to early November. Don't be fooled into thinking that all animals have been caught when numbers fall in the summer months. The outward migration of large numbers of metamorphs (and many adults) in September and October can often surpass numbers caught in the spring. (see Figs. 1 & 2)

Don't expect to have weekends off either. Closing the traps down for the weekend (and opening them again) takes time and if they are closed off on a Friday you will be losing 3 nights trapping which could result in the loss of a significant number of GCN.

Round or square traps?

There are no purpose built amphibian pitfall traps manufactured in this country and I have seen a wide range of household objects being used ranging from flower pots to household buckets. The most useful that I have found are the plastic food containers of 10 litres or more. There is some debate about whether round or square containers should be used. I found square ones to be more practical to use as they are easier to install as less soil is disturbed. Square traps also tend to hold their shape better when backfilled, important when the traps are being closed off when not in use. The most important part of the pitfall trap is the area that lies against the drift fencing. A 250mm square trap has a 20% larger area and a 25% larger perimeter than a 250mm diameter round trap, therefore a square trap will have a larger catchment area against the fence, making it more efficient than a round trap.

How many traps?

The Great Crested Newt Mitigation Guidelines gives details of numbers of pitfall traps required. Clearly, it is best to use as many as is practical (subject

to budget) One method used at Newhaven is to install traps along the centre line of the drift fencing so that animals can fall in the traps from both sides. This method is particularly useful if there is no information as to where the newts are coming from or if they are known to be present on both sides of the fencing. This method also increases the effective catchment area of round traps as it uses the centre of the traps. One downside of this positioning of the traps is that no information can be gained as to where the newts actually came from.

Climbing out

Probably the most important aspect that I have learnt is that the traps should always have an overhang. I found that approximately 30% of the smaller newts (including juvenile GCN and on a few occasions sub-adult GCN) will climb out of the traps if no overhang is provided. I'm sure many budding ecologists will recall their childhood endeavours of collecting newts in a bucket, only to find them gone by tea-time!

I created an overhang by cutting out the centre of the lids to form a 10mm lip. It is possible that some newts could walk across the lip and not fall in but this is probably less than the number that would climb out of the traps. Ideally the lip should be lower down in the trap to minimise this occurring.

Cover them up

After the first few days of trapping I noticed a marked reduction in the number of newts in the traps. The reason for this became apparent as I began to see increasing numbers of Herons by the traps in the early morning. To combat this I placed Chicken wire over the traps. Within 3-4 days I was finding the wire was being moved away by the Herons and amphibian numbers began to drop again. The Herons eventually gave up after I covered the traps with squares of chipboard supported on dowel legs. The legs created a gap of 25mm which is sufficient for all newts and adult toads to crawl under.

The covers also help prevent rainwater from entering the traps and act as a sunscreen.

Predators

Hérons weren't the only predator to make use of the food supply in the traps. On several occasions large numbers of Ground Beetles (*Carabidae*), particularly the Violet Ground Beetle (*Carabus violaceus*) would fall into the traps. A few times I found them attacking Smooth Newts. In one instance I found a live Toad with it's leg eaten away. On each occasion the amphibians were rescued and may have survived. Unfortunately, I did find one sub-adult GCN dead in a trap, partially eaten by beetles while it was still alive. Towards the end of this years' trapping I observed an increased number of Stoats and Weasels by the traps and eventually found their scats and even a footprint in the bottom of one trap. It is not known if they were feeding on the small mammals or amphibians but it was apparent that some individuals had learnt to make use of this regular supply of food.

Too wet

Any period of long term pitfall trapping will mean that occasionally the traps will fill up with rain or surface water. This is not such a problem for the amphibians of course, although it does make it harder to remove them from the traps, but it is potentially fatal for any small mammals that fall in the traps.

One way to reduce the likelihood of surface water entering the traps is to install them slightly above ground level and backfill them so that they are sitting in a 'mound'.

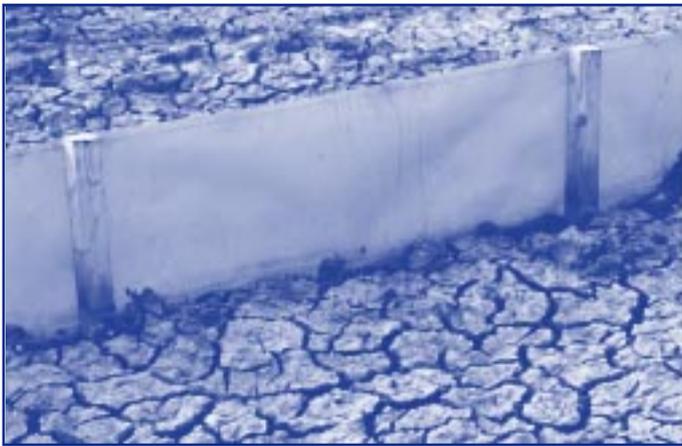
Pumping water out of the traps is very time consuming but will probably be necessary at some point throughout the course of a lengthy trapping period. Using pitfall traps on a flood plain, as at Newhaven, also means that when the water table rises the traps are forced out of the ground.

The only practical remedy is to peg the traps down with wooden stakes. By putting a nail in the stakes, each side of the trap is securely held down.

If the site is likely to flood or the water table is known to be high, it is best to specify that stakes are used when the traps are installed. Putting them in later could pose a risk to any animals that have found their way down the side of the traps.

Too dry

As the ground dries out gaps open up around the pitfall traps and the drift fencing. A judgement then has to be made whether to remove the traps carefully and re-install them, to leave the gaps as they are, or to fill them with fine soil or sand and risk trapping any animals that may have crawled into the gaps. There is a good chance that you will find animals beneath the traps when they are taken up at the end of the project so it should be specified that a licence holder is present when the contractor removes the traps.



All dried up

Small mammals

Any pitfall trapping project will almost certainly trap some small mammals therefore a means of escape must be included with the traps. It is normal practice to provide "mammal ladders" usually consisting of simple sticks to allow any mammals to climb out of the traps. If no means of escape is provided in areas where shrews occur then a shrew trapping licence will be required from English Nature. Not all mammals will climb out despite the inclusion of ladders. When two or more mammals fall in the same trap fighting can occur usually resulting in the death of one of the animals. All small mammals get stressed very easily and fatalities do occur from time to time.

Mammal ladders

In an effort to reduce the number of small mammals found in the traps I ran some tests using varying thicknesses and profiles of mammal ladders to try to establish the optimum size that would allow small mammals to escape yet prevent newts from climbing out.

The tests were conducted in controlled conditions with animals kept over night. In the case of the small mammals different animals were used on each occasion to minimise stressing them.

I found that anything over 5mm in diameter would allow some adult GCN to climb out. Wood Mice, Harvest Mice and the Shrews were all able to climb up ladders of 2mm diameter. The Field and Bank Voles that I tested failed

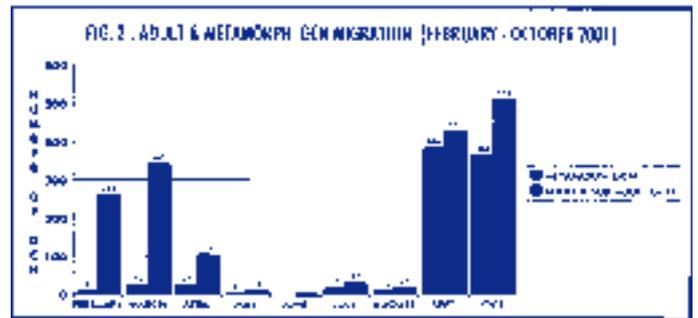
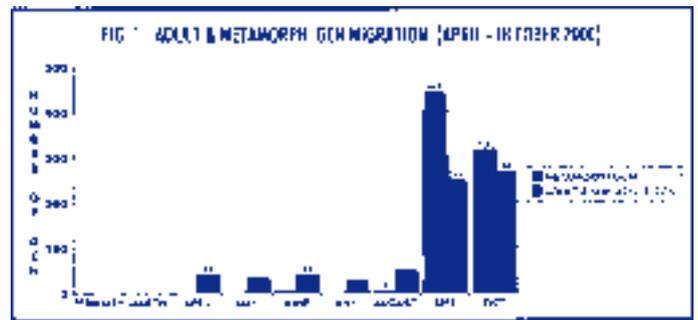
to climb any thickness or profile although testing was limited to only two individuals.

It is not uncommon for the sticks to be removed from the traps by Crows or Magpies and I found that using thin metal rods stopped this happening.

Interpreting Migration Information

Unfortunately, no direct comparison of migration patterns between the two years of trapping on this site can be made as there are no data for February and March 2000 as the project only began in early April 2000. However, some differences can be noted between the two sets of data.

The period April to August 2000 was generally cooler and wetter than the corresponding period this year (2001) and as can be seen from Figs. 1 & 2 the numbers of adult/sub-adult GCN entering the traps was slightly higher in 2001, which is perhaps expected. There is no significant difference in numbers of metamorphs between these periods, which again is understandable as the majority of metamorphs would not have developed at this stage.



The numbers of metamorphs entering the traps during September and October of both years is remarkably similar (754 in 2000 and 761 in 2001) although there is a slight difference in the monthly pattern. However, it should be noted that over 500 adult GCN were removed to the safe enclosures in 2000 so clearly, the 2001 metamorphs would have been produced by the remainder of the adult population outside the enclosures.

There is a much bigger difference however in adult numbers found in September and October 2001 than in the previous year. In 2001 the number of adult GCN was larger than the number of metamorphs.

Significantly, this number was also greater than the number trapped during the inward migration of February and March of the same year. One possible explanation for this could be that weather conditions between April and August 2001 were generally warmer and drier than average and because of this, adult GCN remained closer to their breeding sites, in this case, the ditches, as they offered a more suitable micro-climate.

This late outward migration to the hibernation sites, if repeated elsewhere does have a bearing on any trapping strategy and care should be taken to include this period in any GCN mitigation measures.

Barry Kemp is a self employed herpetological consultant.

In the Journals

Compiled by Pat Rae, Peter
Shepherd and
Jim Thompson



British Ecological Society

C. P. Doncaster, C. Rondinini and P. C. Johnson.

Field test for environmental correlates of dispersal in hedgehogs.

Journal of Animal Ecology, 2001, **70**: 33-46.

This study investigated the dispersal of hedgehogs within a mixed pastoral and arable farmland landscape close to Oxford and also in the City of Oxford. Hedgehogs were released into five areas that were found through nocturnal survey not to contain an existing hedgehog population. The nearest known populations were located between 0.5 and 2 kilometres from the release points. The release locations however, were assessed as supporting a plentiful and available food source. These locations therefore were able to support hedgehogs in at least the short term and were between existing populations. The released animals were radio-tagged and monitored. The results were compared with two release sites in favourable habitat previously studied in similar farmland near to Oxford. The results from the previous release experiments and this study were compared to three control sites.

The study revealed that no two movements of hedgehogs followed the same route and most took animals through existing populations. The hedgehogs showed a significantly stronger attraction to habitat edges, which acted as corridors. A significant proportion stayed closer to roads and to urban habitat than random expectation and habitat preferences shifted significantly towards urban habitat and away from arable areas. Most of the released hedgehogs showed no or little change in body weight and released hedgehogs moved further and faster on average from unfavourable sites looked at in this study than those that had been released into favourable habitat.

The distances moved by the released hedgehogs varied with the maximum distance from a release being 3.8 kilometres with a total movement distance of 9.9 kilometres. These figures were compared to an average home range span of 0.8 kilometres. The authors conclude that although travel between populations in the study area of up to 4 kilometres is a rare event that none of the local populations in the study area are out of reach of the neighbouring population.

O. Kruger and J. Linstrom.

Habitat heterogeneity affects population growth in goshawk (*Accipiter gentilis*).

Journal of Animal Ecology, 2001, **70**: 173-181.

This study investigated the factors and mechanisms that cause fluctuations in the population density of goshawks in Eastern Westphalia, Germany between 1975 to 1999. Authors investigated the concept of site-dependent population regulation, which predicts that increasing population density should lead to use of increasingly poor quality territories and decreasing per capita population growth rate. The authors also considered interference competition as an alternative mechanism to population regulation, which

would be expected to result in a more even reduction in individual success with increasing population density than site dependent population regulation.

The study was based on long-term population data for goshawk. The principal habitat within the study area of 250 square kilometres is mixed spruce, beech and oak forest in a low mountain region. The second principal habitat is a lowland cultivated landscape composed of beech and oak forests. Habitat quality was assessed using the mean occupancy frequency in a given year, occupancy frequency of territories across the study period and also the period over which occupancy has taken place (i.e. the first year occupancy was recorded). The number of breeding pairs in the study area fluctuated between 6 and 18 over the 25 year study period. Highest densities were recorded in the late 1970's with a sharp decline in the 1980's followed by a steady recovery. The authors conclude that the territory occupancy patterns and reproduction characteristics support predictions of site dependent regulation of population growth. Those territories that were occupied most frequently and earlier had a higher mean brood size. In addition fertility did not decrease with increasing density in the highest quality territories.

The authors also used time-series modelling to analyse the results of the 25 years of monitoring and report that the best model explaining per capita population growth rate included annual mean habitat quality, weather during chick rearing and in the autumn and density as variables. This model explained 63% of the variation in per capita growth. The authors conclude that the need to include habitat quality data in time-series models supports site dependent population regulation in goshawks.

J.B. Whittaker.

Presidential Address: Insects and plants in a changing atmosphere.

Journal of Ecology 2001, **89**: 507-518.

It is never easy to review a Presidential Address because each is invariably a distillation of a vast amount of ecological material and experience - in short a substantial review in its own right. This address is no exception but it is one which assumes particular practical significance in the light of the increased pollution of the atmosphere by Sulphur Dioxide, Nitrogen dioxide, Ozone, Carbon Dioxide and temperature in the context of global warming. Work on the effects of these pollutants on plants is not new but the real interest of this review is how these effects interact with populations of predators and in particular insects. Having undertaken a good number of these reviews, I might perhaps be forgiven for taking a certain satisfaction in finding a reference to a paper by Port and Thompson, 1980 which reported increased densities of some insect herbivores close to busy roads in relation to observed elevated concentrations of nitrogen in the foliage. Twenty years later there is a mass of information now available.

The clear message to anyone with an interest in the field is to read this paper because I do not feel that a review of this type can do justice to it. Plants grown in elevated levels of SO₂ and NO₂ may exhibit increase populations of insect herbivores but fascinatingly the damage so caused may be instrumental in increasing the uptake of these two pollutants by the plant. Ozone it seems is much more difficult to predict and the responses experimentally have been shown to be varied. It appears that increased levels of CO₂ not unexpectedly lead to greater leaf area production in some species but this may be accompanied by greater insect chewing in an apparent attempt to compensate for a change in the carbon: nitrogen ratio. Finally there is the question of temperature which in itself is a consequence of increased levels of carbon dioxide, oxides of nitrogen, ozone and sulphur dioxide.

A. Davy, G.F. Bishop & C.S.B. Costa.

Biological Flora of the British Isles, No 219 *Salicornia* L. (*Salicornia pusilla* J.Woods, *S. ramosissima* J. Woods, *S. europaea* L., *S. obscura* P.W. Ball & Tutin, *S. nitens* P.W. Ball & Tutin, *S. fragilis* P.W. Ball & Tutin and *S. dolichostachya* Moss)

Journal of Ecology, 2001, **89**: 681 - 707.

This well respected series from time to time covers species of particular ecological or conservation interest. This certainly applies to the several species of glasswort or samphire which are found in most salt marshes in the British Isles and western Europe. Indeed it is widely eaten in France and occasionally in the UK under the name of the Norfolk samphire. *Salicornia* spp. are import pioneers of salt marshes and low marshes and mud flat stands of *Salicornia* have been designated as SAC's under the European Habitats Directive. The review contains a wealth of information about the several species in the UK and Western Europe but precedes it with a fairly complex debate as to what actually constitutes a species in this particular group.

J.S. Carrion, M. Muniera, M. Dupre & A. Andrade.

Abrupt vegetation changes in the Segura Mountains of southern Spain throughout the Holocene.

Journal of Ecology, 2001, **89**: 783 - 797.

The interest in this paper lies in its location. Often we have reports about climate change and history in Scandinavia which have implications for other areas. On this occasion, the report is from Spain - the Segura Mountains of Southern Spain.

Remarkably the fossil pollen record of Canada de la Cruz in the Segura mountains of Southern Spain gives an insight extending over the last c. 8320 years. Phases of xerophytic grassland alternate with high mountain open pine forests and expansion of deciduous forest and Mediterranean scrub at lower altitudes. Longer term stable vegetation patterns are interrupted by multidecadal to century-scale shifts at about 7700, 3370, 2630, 1525 and 790 years BP.

Some of the vegetation types have no modern analogues and represent high altitude remnants of widespread last-glacial xerophytic communities. Other species patterns, characteristic of current scrub associations, appeared only within the last 800 years.

The sequence fits within the regional context of a generally wet mid-holocene (c. 7700-3300 years BP) characterized by greater abundance of xerophytes.

The pollen record and current ecological studies on high-elevation vegetation of Mediterranean Spain suggest that control of vegetation is primarily climatic although grazing pressure, which would have pushed vegetation over a threshold for change, cannot be discounted.

M. Köchy and S.D. Wilson.

Nitrogen deposition and forest expansion in the northern Great Plains.

Journal of Ecology, 2001, **89**: 807 - 817.

Atmospheric nitrogen(N) deposition has become one of the most important agents of vegetation change in densely populated regions. It may also

contribute to forest expansion into grasslands at the northern edge of the North American Great Plains.

N deposition and available soil N was measured with ion-exchange resin over 2 years in six national parks in areas varying in population density and industrialization. N deposition was significantly higher in four parks in densely populated regions than in two remote parks. Available N increased significantly with N deposition across all parks.

N mass and ¹⁵N abundance was measured in vegetation and soil in two parks: Elk Island receiving 22kg N ha⁻¹ year⁻¹, and Jasper, receiving 8kgN ha⁻¹ year⁻¹. Differences between parks in tissue N concentrations were small, but forest expansion over five decades resulted in the mass of N in vegetation increasing by 74% in Elk Island but by only 26% in Jasper. δ¹⁵N in forest vegetation was significantly lower in Elk Island than in Jasper suggesting that anthropogenic sources contribute significantly to the high rates of N entering that ecosystem.

The rate of forest expansion within parks was determined using six decades of aerial photographs. Parks in aspen parkland and boreal forests showed a strong positive relationship between forest expansion and N deposition. The relationship found between N deposition, available soil N and forest expansion suggest that even comparatively low rates of N deposition may accelerate the expansion of forest into temperate grasslands.

K Verheyen and M Hermy.

The relative importance of dispersal limitation of vascular plants in secondary forest succession in Muizen Forest, Belgium.

Journal of Ecology, 2001, **89**: 829 - 840.

Distribution patterns (frequency and percentage cover) of 18 forest plant species were studied in 34ha of mixed deciduous forest (Muizen Forest, North Belgium). Stands varied in age between 6 and more than 223 years and both slow and fast colonizing species were studied.

Detailed land use history data were combined with the species distribution maps to identify species-specific colonization sources and calculate colonization distances.

The authors were able to distinguish species which are limited by both dispersal and recruitment (*Primula elatior*, *Arum maculatum* and *Lamium galeobdolon*), mainly by dispersal (*Anemone nemorosa*, *Deschampsia caespitosa*), mainly by recruitment (*Paris quadrofolia* and *Polygonatum multiflorum*) and by neither (*Geum urbanum*, *Ranunculus ficaria*, *Glechoma hederacea*, *Aegopodium podagraria*, *Ajuga reptans*, *Adoxa moschatellina* and *Oxalis acetosella*).

The low colonizing capacity of ancient forest plants cannot be attributed to a single cause: rather both dispersal and recruitment are limiting but the relative importance varies.

The second section of Volume 38 of the Journal of Applied Ecology deals with grasslands, grazing and biodiversity as a special profile of the journal. It is another successful attempt to group a number of papers under a common and particularly topical theme.

A.R. Watkinson and S. J. Ormerod.

Grasslands, grazing and biodiversity: editor's introduction.

Journal of Applied Ecology, 2001, **38**: 233 - 237.

This introductory paper sets the scene in a useful and practical way. Natural, semi-natural and artificial grasslands occur extensively around the globe but successful management for production and biodiversity poses several dilemmas for conservationists and farmland managers. Drawn from three continents, the papers address three specific issues: plant responses to grazing, plant invasions and the responses to management of valued grassland biota.

S.M. Buckland, K. Thompson, J.G. Hodgson and J.P. Grime.

Grassland invasions: effects of manipulations of climate and management.

Journal of Applied Ecology, 2001, **38**: 301 - 309.

This paper reports on the potential of climate change in combination with changes in land use in giving rise to new opportunities for grassland invasion. Plant species, sown into experimental plots as part of a 6-year study investigating factors limiting the success of seedling invasions, were surveyed in 1999, 3 years after terminating experimental manipulations of climate, soil fertility and disturbance. The most dramatic observation was the protracted expansion in populations of *Brachypodium pinnatum*, despite being at the northern limit of its distribution in Britain. In contrast all other sown species, including those of both southern and widespread distribution in Britain, had become extinct, declined or remained unchanged in abundance. The advance of *B. pinnatum* was highest in the areas of the experimental plots unamended by fertilizer and physical disturbance but expansion was apparently promoted by cessation of management. This study reveals the hidden potential of a native species to establish beyond its current range of distribution and, contrary to many recognised weeds, the capacity to achieve dominance in the absence of eutrophication or disturbance. This highlights the potent effects of climate change when plant traits effective for establishment coincide with the removal of current barriers to dispersal.

M. di Giulio, P.J. Edwards and E. Meister.

Enhancing insect diversity in agricultural grasslands: the roles of management and landscape structure.

Journal of Applied Ecology, 2001 **38**: 310 - 319.

During the last few years a variety of methods have been applied in Switzerland to preserve and enhance biological diversity in agricultural systems. The purpose of the study was to evaluate grassland management techniques in respect of their effectiveness within a managed area and to examine how these areas contribute to species diversity at a landscape scale.

Insect diversity in grasslands subject to different management in a heterogeneous landscape in part of the Swiss Jura was examined. Four study areas with varying landscape structure were selected and, in each

area, meadows of two grassland management types were investigated. The true bugs were chosen as an indicator group for insect diversity on the basis of previous work that had shown that the richness of the bug fauna correlates strongly with total insect diversity.

Individual species differed in their responses to management. Two species benefited from intensification whereas six species were affected negatively by intensive management. Two main groups of species did not appear to respond to management. The study indicated that extensive management of grasslands can enhance both local and regional insect diversity in agricultural landscapes. Extensively managed meadows were species-rich habitats that supported some rare and specialized species. In contrast the bug community of intensive meadows was dominated by more widespread and less specialist species.

M.Ausden, W.Sutherland and R. James.

The effects of flooding lowland wet grassland on soil macroinvertebrate prey of breeding wading birds.

Journal of Applied Ecology, 2001, **38**: 320-328.

This paper is topical in view of the floods experienced in the UK and western Europe in autumn, 2000. Lowland wet grassland is often managed for breeding wading birds and recommended conservation management often entails introducing winter flooding. In Britain, there is now government funding to encourage this through the Environmentally Sensitive Area scheme. The paper explores the effects of flooding on the soil macroinvertebrates and in relation to the requirements of particular bird species.

It concludes that the best feeding conditions for breeding snipe will be provided by keeping the upper soil soft enough for them to probe in but without reducing soil macroinvertebrate mass by flooding it beforehand. Optimal conditions for breeding lapwings and redshank will probably be provided by creating a mosaic of unflooded grassland, winter-flooded grassland and shallow pools.

A.P.Møller.

The effect of dairy farming on barn swallow *Hirundo rustica* abundance, distribution and reproduction.

Journal of Applied Ecology, 2001, **38**: 378-389.

At a time when many traditional agricultural practices are under review, this paper sheds interesting light on the effects of dairy farming. The investigation compared the abundance, phenotype and reproduction on the same farms before and immediately after dairy farming ceased, while a control sample of farms without change in farming practice in the same years was used as a check.

The abundance of swallows decreased significantly when dairy farming ceased with an average reduction of 48% while there was no significant difference in the control farms. This was due to a decrease in the abundance of yearly immigrants. The abundance of insect food decreased significantly in the absence of cattle and again, there was no difference in the control farms.

The observations suggest that the termination of dairy farming reduces local population size, reproductive success and the quality of offspring produced.

J. Weiner, H.-W. Griepentrog and L. Kristensen.

Suppression of weeds by spring wheat *Triticum aestivum* increases with crop density and spatial uniformity.

Journal of Applied Ecology, 2001, **38**: 784-790.

This paper is a pleasure to read, and some of our UK scientists could take lessons from their Danish colleagues about writing clearly in English! The subject matter is attractive as well, with the introduction of a novel grid sowing pattern rather than the traditional linear one having implications for crop yields as well as providing herbicide free weed suppression.

There is increasing interest in reducing the use of herbicides in agriculture because of concerns about their environmental effects. Mechanical weed control, the major alternative to herbicide application, also has negative environmental impacts due to energy consumption and additional traffic on fields.

Crop seedlings are usually larger than weed seedlings immediately after germination, and there is evidence from recent studies that the advantage of size in competition increases with density.

The authors hypothesised that weed suppression can be realised if: (i) the crop density is increased significantly and (ii) the crop is regularly (uniformly) distributed in two-dimensional space rather than sown in traditional rows. Previous crop density experiments have used the linear sowing method, which only addresses density in one dimension. The practical effectiveness of weed suppression will be a balance between the size and density effect on suppressing the weeds and loss of yield due to intra-specific competition.

In field trials in 1998, in the presence of high weed pressure, the authors sowed four varieties of Spring Wheat (*Triticum aestivum*) at densities of 200, 400, and 600m⁻² and in two spatial patterns (normal 12·8-cm rows and a uniform grid). To provide the high weed pressure, spring rape *Brassica napus* L. was dropped onto the soil surface at a rate of 200 m⁻². They measured the total biomass of weeds at the approximate maximum (6–10 July 1998) by harvesting, drying and weighing all above-ground weed biomass within a single randomly placed 0·25-m² quadrat in each plot. At maturity in early October, the crop was harvested and grain yield determined after cleaning. The experiment was repeated in the following year (1999), with the medium and high densities increased to 450 and 720 m⁻².

There were strong and significant effects of both crop density and spatial distribution on weed growth. Weed biomass decreased with crop density and was 30% lower in the grid pattern. There was a negative linear relationship between above-ground weed biomass in early July and crop yield at harvest, so weed suppression translated directly into yield. The treatment with high crop density and the grid sowing pattern contained 60% less weed biomass and produced 60% higher yield than the treatment closest to normal sowing practices (crops sown in rows at 400 m⁻²).

The results were similar when the experiment was repeated in the following year, even though weed abundance was lower and the weed community was very different. There was 30% less weed biomass and 9% higher yield when the crop was sown in a grid pattern.

A critical aspect of the ability of a crop to produce high yields after suppressing weeds at high density is the shape of the simple density–yield curve. If harvestable yield decreases steeply above the optimum (weed-

free) density, then the densities required for weed suppression may give only low yields. If the density–yield curve is relatively flat, as it is for many cereal crops, then these higher densities can be used for weed suppression.

While weed biomass decreased with density for all varieties, a significant variety–density interaction suggested that the attributes that result in good weed suppression at high crop density may not be the same as those that are most advantageous at low crop density.

The authors finish by calling for the development of ‘high density cropping systems’ in which competition among plants in the field is seen as something to be influenced and directed, not, as in the conventional view, something to be avoided. A more crowded, uniform, distribution of some crops could contribute to a strategy to reduce the use of herbicides and energy-intensive forms of weed control.

The effectiveness is a balance between the size and density effect on suppressing the weeds and loss of yield due to intra-specific competition.

O. Bustnes, V. Bakken, K.E. Erikstad, F. Mehlum and J.U. Skaare.

Patterns of incubation and nest-site attentiveness in relation to organochlorine (PCB) contamination in glaucous gulls.

Journal of Applied Ecology, 2001, **38**: 791-801.

A general conclusion from a wide variety of experimental and observational studies is that heavy metals and various organochlorines (OC) induce changes in behaviour, but there is little evidence of serious threats to populations. Field assessments are invariably confounded by ecological differences between contaminated and uncontaminated sites and the behaviour of individual birds in the field has rarely been related to the contaminant burden.

This study does what has not been done before, namely to measure OC contaminant levels and to study behaviours in the same individuals that can be linked to population parameters, such as reproduction and survival. This includes the ability of birds to conduct complex behaviours such as food gathering, pairing or chick rearing. For instance, the nesting period is critical in avian reproduction because both the offspring and the parents are vulnerable to predation and starvation. Any changes in behaviours related to incubation and nest defence might have an effect on reproductive output.

This work was carried out during 1998 and 1999 on Bear Island, in the North Atlantic. It is 178 km² in area and located at latitude 73°N. The southern part of the island holds one of the largest concentrations of breeding seabirds in the north-eastern Atlantic. Aberrant behaviours and unexplained deaths have been reported among glaucous gulls on the island, and it is assumed that the high levels of OC are contributing factors.

In glaucous gulls (*Larus hyperboreus*), both males and females participate in the care of offspring, including incubation, nest defence and feeding. They are predatory, breeding in colonies where unattended eggs and small young are often eaten by conspecifics. This necessitates close co-ordination of incubation shifts and feeding trips between mates to ensure offspring survival. If one parent fails to synchronise its behaviour, the mate may be forced to leave the nest unattended to feed. The authors have assumed that the time spent incubating and the time spent attending the nest site when not incubating are good measurements of reproductive investments,

and their interpretation, based on other workers' findings, is that low incubation effort and/or frequent absence from the nest, associated with high PCB levels, are adverse effects.

To separate the effects of PCB on nesting behaviour, the authors examined individual patterns of incubation and nest-site attentiveness in relation to OC burden of 27 glaucous gulls. The OC burden was measured as polychlorinated biphenyl (PCB) concentration in the blood. This ranged from 52 ng g⁻¹ to 1079 ng g⁻¹ (wet weight). There were significant differences between the two breeding areas, and females had significantly lower concentrations than males.

Gull behaviour differed significantly between the breeding areas and sexes independently of PCB. Females incubated more than males (54% vs. 46%) but spent more time away from the nest site than males, both overall (23% vs. 12%) and when not incubating (50% vs. 21%). They were also absent for longer periods (4.5 vs. 2.8 h). Moreover, length of incubation bouts (6.4 vs. 4.4 h), the amount of time absent from the nest site when not incubating (51% vs. 25%) and length of absences (5.6 vs. 1.8 h) differed between breeding areas, probably due to different feeding specialisations.

After correcting for the area and sex effects, the proportion of time absent from the nest site when not incubating, and the number of absences, were both significantly related to blood concentration of PCB.

This study did record clutch size, but does not refer directly to any effects on reproductive success, so therefore the overall conclusions are a little disappointing. Instead the authors refer to recent studies by other researchers who have found that incubation has considerable energetic costs, and an increase in these costs can lead to reduced reproductive output. Thus increased absence from the nest site in individual glaucous gulls with high blood concentrations of OC suggests effects on reproductive behaviour. The authors finish by speculating that endocrine disruption or neurological effects might be involved, leading to increased energetic costs during incubation and reduced reproductive output.

J. A. Gill, K. Norris and W. J. Sutherland.

The effects of disturbance on habitat use by black-tailed godwits *Limosa limosa*.

Journal of Applied Ecology, 2001, **38**: 846-856.

The effect of human disturbance on animal distribution has received considerable attention in recent years. Assessing the severity of the effects of disturbance has important practical consequences; if it has serious impacts, conservationists are justified in recommending that access to wildlife areas be limited. However, if the impacts of disturbance are trivial, then such measures cannot be justified. Restricting human access to the countryside can be expensive and time-consuming but, more importantly, it goes against the increasing view that rural access should be increased. Moreover, access to areas of conservation value can be the best way to protect them, as it increases the value placed on them by society. There is therefore a need to quantify the extent to which disturbance adversely affects animal populations, in the context of a wider debate of how much human access to wildlife areas should be sanctioned or discouraged. There are two components to the problem of disturbance: whether human presence causes animals to avoid areas that they would otherwise use, and whether this in turn affects mortality, reproductive

success or population size. The majority of studies of disturbance refer to the first component.

Little attempt has been made to assess whether human presence limits the number of animals that sites can support. This can be quantified by incorporating measures both of human presence and of resource distribution into analyses of population distribution. The effects of disturbance can then be measured from any reduction in resource use at disturbed sites, which in turn indicates any reduction in the number of animals supported.

Shorebirds are often considered highly susceptible to disturbance because of their very obvious flight responses to humans and because they use areas that are generally subject to high levels of human recreational use.

This study addressed the effect of human presence on the distribution of black-tailed godwits *Limosa limosa islandica* on five estuaries in eastern England (the Alde, Deben, Orwell, Colne and Blackwater). The authors identified prey types selected by godwits and related their depletion to different levels and types of human disturbance at a range of spatial scales.

Three methods of analysis were used: simple regressions of the effect of human activity on the number of godwits; multiple regression analyses of the effect of human presence and prey density on godwit numbers; and analyses of the effect of human presence on prey density at the end of the season. The latter method assumes that godwits are responsible for the majority of resource depletion. None of the analyses showed any effect of human presence on the number of godwits supported by the food supply at any of the spatial scales examined.

Many species may appear to avoid human presence but this may not reduce the number of animals supported in an area. Assessing the influence of disturbance on the relationship between animal distribution and resource distribution provides a means of assessing whether numbers are constrained by disturbance.

The authors finish with a cautionary note. It may appear that a study showing that human presence has no impact on the species in question means that disturbance is relatively unimportant in conservation terms. However, a major factor likely to influence whether or not species respond to humans by avoiding specific areas is the risk of mortality associated with human presence. Thus, species that are hunted by humans might be expected to avoid humans more than species that are not hunted. Thus, while the role of human presence in constraining numbers of animals on particular sites can be assessed using the methods described here, quantifying the population consequences of these constraints will be far more complex.

R. A. Stillman, J. D. Goss-Custard, A. D. West, S. E. A. Le V. Dit Durell, S. Mcgrorty, R. W. G. Caldow, K. J. Norris, I. G. Johnstone, B. J. Ens, J. Van der Meer and P. Triplett.

Predicting shorebird mortality and population size under different regimes of shellfishery management.

Journal of Applied Ecology, 2001, **38**: 857-868

This paper relates to the last paper and also links to the talk given by Dr Goss-Custard at IEEM's 14th Conference held at Torquay 28/29 November

2001, *Conflicts in Estuary Management – Birds as Indicator Species*. The proceedings of the Conference will be published early next year. In the meantime, this paper is definitely worth a read as part of the ongoing body of work from Dr Goss-Custard and his colleagues. Much of the summary is produced below to whet the appetite.

Previous studies have shown that the removal of shellfish from the most productive beds, along with any disturbance it causes over low water, drives birds from their preferred feeding areas to poorer quality areas where, additionally, increased bird densities intensify interference and exploitation competition for food. This reduces intake rate and increases the probability that oystercatchers (*Haematopus ostralegus*) die of starvation in winter, when they may already have difficulty in obtaining their energy requirements.

Despite intensive research, the effects on oystercatchers of current and potential shellfishery management policies are usually unknown. One long-running contentious issue has been how to manage mussel *Mytilus edulis* and cockle *Cerastoderma edule* shellfisheries in a way that has least effect on a co-dependent shorebird, the oystercatcher, which also consumes these shellfish.

To help resolve this, the authors built and field-tested a behaviour-based model. This can evaluate both current and alternative shellfishery regimes because it incorporates the main bird responses to shellfishing, which are behavioural. By coupling the behaviour-based model for oystercatchers with a conventional demographic shellfish population model, the cumulative

effects of policy over many years can also be explored for both birds and shellfish. This study used the behaviour-based model to explore the effects that the present-day management regimes of a mussel (Exe estuary, UK) and a cockle (Burry inlet, UK) fishery have on the survival and numbers of overwintering oystercatchers. The study also explored how alternative regimes might affect the birds.

The model includes depletion and disturbance as two possibly detrimental effects of shellfishing and some of the longer-term effects on shellfish stocks. Importantly, model birds respond to shellfishing in the same ways as real birds. They increase the time spent feeding at low tide and feed in fields and upshore areas at other times. When shellfishing removes the larger prey, birds eat more smaller prey.

The results suggest that, currently, neither shellfishery causes oystercatcher mortality to be higher than it would otherwise be in the absence of shellfishing; at present intensities, shellfishing does not significantly affect the birds. However, they also show that changes in management practices, such as increasing fishing effort, reducing the minimum size of shellfish collected or increasing the daily quota, can greatly affect oystercatcher mortality and population size, and that the detrimental effect of shellfishing can be greatly increased by periods of cold weather or when prey are unusually scarce. By providing quantitative predictions of bird survival and numbers of a range of alternative shellfishery management regimes, the model can guide management policy in these and other estuaries.

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IEEM Conference 2001 – Torquay – a retrospect

Peter Beale, MIEEM

The IEEM's annual conference and AGM was held at the Grand Hotel in Torquay between the 27th and the 29th November. The topic *Getting Wet! Ecological Challenges in marine, estuarine and river environments* proved very popular and 175 delegates listened to the 16 speakers. The Fellows Lecture on the first night was given by Dr Phillip Edwards and his memorable presentation was based round stunning photographs of the kind of places where few ecologists go – often because they are in, or have been in, war zones.

The conference itself was divided into three sessions, entitled 1) *The Coastal Zone: Systems and Estuaries*, 2) *Catchment management and land use* and finally 3) *Management for sustainability in action*. An excellent range of very well delivered papers was complemented by field excursions. These enabled participants to visit one of four sites along the south Devon coast and on Dartmoor. The visit to Dawlish Warren LNR and NNR provided Andrea Buckley with the opportunity to explain how Teignbridge District Council manages this dune system for its unique wildlife and up to 20,000 visitors per day in summer. Natasha Barker, The Exe Estuary Partnership Management Project Officer, then explained how the remainder of the estuary is managed and how conflicts between users are resolved. The second excursion, to Slapton Sands and the Ley, was led by Andy Nisbet, and the group was able to see how the Ley is managed by the Field Studies Council. This NNR is the largest and most significant area of natural freshwater in Devon and it is separated from the sea by a very narrow and extremely vulnerable shingle ridge – just! The third group visited one of Dartmoor National Park's Biodiversity Project's sites. Broadaford is one of the most outstanding farms on the Moor, for its wildlife value. Susan Bragg was able to show a range of habitat types, like Rhos pasture. The presence of nationally rare and declining species like Bog Hoverfly and Marsh Fritillary, make this an important site. The fourth excursion to the Marine Biological Association and the National Marine Aquarium in Plymouth was led by Eirene Williams.

being rated very highly. The Hotel also provided ideal surroundings for informal meetings and for networking. Participants were able to take away up-to-date and valuable knowledge, many new contacts and personal action plans.



Of the 175 people who participated in the conference, 54% were members of the Institute. Such was the standard of the sessions, that many of the non-members expressed an interest in joining. It is hoped that they will and we look forward to welcoming them.



The Exe Estuary Field Excursion

Analysis of the evaluation forms completed by delegates, shows very high levels of satisfaction with the topics covered in the formal sessions and with the way in which they were delivered by our speakers. The field visits were also given very favourable ratings. The Grand Hotel proved to be an excellent venue for the Conference, the standard of accommodation and the catering

The Conference also provided an opportunity for delegates to enjoy the social side and Mrs Crotty's Ceilidh Band provided an ideal opportunity for those who are young at heart and fleet of foot to network by linking hands in a series of strenuous barn dances – great fun was had by all!

The Conference also provided the opportunity for the Institute to hold the ninth Annual General Meeting. Sue Bell is now the President-elect and three new members of Council were elected. They are Nick Carter, Kathy Dale and Steve Pullan. Outgoing Council members on completion of 6 years on Council - Pat Rae, Janet Swan and Jacqui Green were thanked for all the time, energy and expertise they have provided to Council and to the Institute. Carol Crawford and Heather Tidball were also retiring from Council. Tribute was paid to Jim Thompson for his administration of the Institute and for the huge amount of time he devotes to making sure its needs are met.

In retrospect, it was a very good conference – one that demonstrated the way in which the Institute is gaining support and respect for its work. The way in which it continues to promote professionalism amongst ecologists and those who manage the natural environment is now widely recognised. Good conferences, like this one, help to raise our profile enormously.

Dr Peter Beale is Director of Sunflower International Ltd.

Recent Publications

Countryside Recreation Vol. 9 number 3/4, ISSN 0968-459X

This is the regular publication of the Countryside Recreation network and generally provides articles clearly applicable to the subject area. This edition focuses on the Foot and Mouth Disease and in particular, the effects on access and recreation. The main concern of IEEM members has of course been the restrictions on access in the context of undertaking survey work but many of the access issues impinge on the wider rural economy. The outbreak appears now to be over with over 2 months since the last case but the issue will remain a live one for many months to come.

Followed by an editorial on the subject, there are chapters on:

- Rural Change and the impact of FMD
- A personal perspective from Galloway, South West Scotland
- FMD - its effects on Open-air recreation in Scotland
- The impact of FMD on the Youth Hostels Association
- The impact of FMD on three outdoor recreation providers in Northern Ireland
- Time to start walking again
- Overlooking the importance of Countryside recreation - who is to blame?
- Handling FMD for waterway recreation
- Cycling in the Countryside - back on track
- Finally, A new role for recreation?

All of this illustrates in no uncertain terms the implications for the economy outside straight agriculture and it makes for very interesting reading.

Climate Change and Nature Conservation in Britain and Ireland - MONARCH - P.A. Harrison, P.M. Berry and T.P. Dawson (eds.)

At 271 pages, this is an impressive summary which includes a useful set of models and techniques to help us consider how climate change might impact on wildlife and geomorphological features and the report identifies the broad implications for nature conservation, policy and practice.

There are nine chapters preceded by an overall executive summary:

- The MONARCH project: Study aims and methods
- Bioclimatic classification for Britain and Ireland
- Characterising the bioclimatic classification
- Impacts on terrestrial environments
- Impacts on freshwater environments
- Impacts on coastal environments
- Impacts on marine environments
- Overview of impacts, adaptation and vulnerability
- Implications for policy needs and future research.

Available from: The UKCIP Programme Office, Union House, 12-16 St. Michael's Street, Oxford, OX1 2DU.

Tel: 01865 432076, Fax: 01865 432077

Email: enquiries@ukcip.org.uk

National Vegetation Classification - Field Guide to Mires and Heaths ISBN 1 86107 526 X

For those with a professional interest in this area, this guide is essential reading but probably best avoided at bedtime.

It starts with an introduction to the National Vegetation Classification, defines Mires and Heaths in the context of the guide, gives guidance on use and also supplies a useful set of references.

The next chapter gives dendrogram keys to the mire communities and is then followed by descriptions of 38 mire communities. There are then the dendrogram keys to heath communities followed by descriptions of 22 heath communities.

Available from: JNCC, Monkstone House, City Road, Peterborough, PE1 1JY.

English Nature Corporate Plan 2001 - 2005 - working today for nature tomorrow. ISBN 1 85716 5764

This welcome publication is a substantial statement of the work and priorities for English Nature for the next 5 years. At 86 pages it is rather too lengthy to be given proper treatment in this column but the four main areas of work are defined as:

- protecting and enhancing the wildlife value of protected sites;
- improving the wider environment and the sea for wildlife;
- influencing people's hearts, minds, policies and actions in support of nature conservation;
- modernising and managing English Nature.

There are several significant targets identified under each of the areas.

These programmes are supported by underlying work areas of science and communications.

At the end of the publication are some lengthy tables giving details of what can be expected to be achieved during each year. There is passing reference at the front of the publication to the effects of FMD - an illustration of how something totally unexpected can affect such a programme. Many of these are impressive targets especially bringing the SSSI's and other protected sites into favourable condition - English Nature is certainly going to be busy.

Available from:

English Nature, Northminster House, Peterborough, PE1 1UA

The Good Seed Guide - all you need to know about growing trees from seed. ISBN 0-904853-01-2

Produced by the tree council, this handy volume has a separate section on each of the more common tree species in the UK. The end of the book has separate sections on collecting seed, preparation, stratification and germination, sowing, taking and planting cuttings, planting out and aftercare. This is not a publication for the specialist but could contribute to the important role of influencing people's actions in support of nature conservation.

Available from: The Tree Council, 51 Catherine Place, London, SW1E 6DY.

Association of Inland Navigation Authorities - A vision for the strategic enhancement of Britain's Inland Navigation Network.

This is an interesting publication which illustrates very well the extensive network of inland waterways in England and Wales. The report identifies several gaps in the existing network - gaps that have always been or which have occurred through neglect and dereliction. One of the most eye catching is the full restoration of the Wey and Arun Canal from the Thames to the South Coast. Many of the proposed projects will require major capital investment as is illustrated in the stunning Falkirk Wheel which allows the link to be made again between the Forth and Clyde and the Union canals in Scotland. The overall concept of canal extension and restoration fits well within the concept of sustainability but could well be cause for legitimate concern from the nature conservation viewpoint.

Available from: The Association of Inland Navigation Authorities,

Willow Grange, Church Road, Watford, WD17 4QA

Tel: 01923 201286, Fax: 01923 201455.

Go Mad! 365 daily ways to save the planet

ISBN 0-9541363-0-6

Edited and compiled by The Ecologist, this is indeed the filler for the Christmas stocking. It is full of suggestions that every IEEM member should already be undertaking, ranging from organic turkeys to choosing wine with natural corks, with lots on energy saving and finally the preparations for that woodland burial!

Available from: Alton Logistics Ltd, Unit 4, Battle Road, Heathfield,

Newton Abbot, Devon TQ12 6RY. (£3.99 plus £1.00 p&p)

Tel: 01626 832225, Fax: 01626 832398

News In Brief

WWF 40th Anniversary

It is now 40 years since the founding of WWF and the latest edition of WWF News give full coverage to this noteworthy event. Apparently WWF has spent some £1.8 billion at today's conversion rates and it rightly proclaims some of the successes stemming from that expenditure. There have been a wide variety of themes - tigers, polar bears, rhinos, wildlife trade and the formation of CITES, golden lion tamarin, ivory, whales and more general themes such as the environment, the Antarctic, forests, oceans, education and finally people. This last issue is important since human poverty is one of the greatest factors driving habitat loss and over use of natural resources. There is growing evidence that the key theme of the Rio + 10 Conference will be the interaction between environmental issues and poverty. Not all the themes have been without controversy or totally successful but as a record over the whole period it is impressive.

WWF has also a vision for the UK - 2020:

less land-borne pollution running into the sea; Sustainable fisheries;

Fishing free zones; Areas of no construction on the coast;

No marine dumping or mining; Healthy, vibrant seas not being fished or polluted to death; More protected areas inland; The re-creation of nature that we have lost such as wetlands and forests; More sustainable ways of building, farming and travelling; Ecologically friendly housing and other buildings - quite an agenda for the future.

The Mersey Forest - Little Wood, Knowsley

Little Wood at Stockbridge Village in Knowsley may not be the best known but it appears to mirror many of the problems of woodland management in urban areas or the urban fringe. Literally tonnes of rubbish, burnt out cars and fire damaged trees are coming out of the woodland whilst improved footpaths, protective fencing, new hedges and community spirit are going in! It seems that not for the first time, the creation of a community spirit and feelings of pride of ownership are the key to success in these areas. Behind this however lies a clearly well structured operation with funds coming from 8 different sources. Overall it is part of the Mersey Forest.

British Waterways and Groundwork Announce Partnership

Sustainability is very much on the agenda at the moment but looking for practical initiatives is not always so easy. The purpose of this partnership is to bring lasting benefits to the quality of life in local communities by using the waterway network as a catalyst for sustainable regeneration. The principle objectives of the partnership are to:

- help deliver Government policies on sustainable development by promoting and delivering an integrated approach to economic, social and environmental regeneration;
- realise the full potential of canals and rivers to canalside communities and neighbourhoods and the value they can bring to wider regeneration strategies, both urban and rural;
- improve the effectiveness of both organisations by developing awareness of complementary strengths and by sharing good practice;
- raise the profile of shared issues and achievements by creating opportunities and adopting a joint approach to influencing others and attracting further resources.

New Countryside Access Rights

The Countryside Agency in England and the Countryside Council for Wales are starting to address the issue of Countryside Access rights as set up under the CRoW Act. In England the two lead areas are the South East and the North West. Maps will be produced of all areas of open country and common land - open country is defined as areas which are predominantly mountain, moor, heath and down.

First Outline Maps for the Berwyn

The Countryside Council for Wales has revealed its first outline maps for the Berwyn at a public meeting in Llangollen. This area is the first in Wales and the mapping and consultation work will be reviewed before CCW moves on in the summer of 2002 to publish draft plans for Pembrokeshire, the Black Mountains, parts of the south east Wales Valleys and southern Snowdonia. All other areas will be mapped in 2003. After the consultation period, CCW will publish amended maps. At that stage, owners and others with a legal interest in the land may appeal to the Assembly, if they think their land has been included wrongly. When the Assembly has decided on the appeals, CCW will make final versions of the maps. The Assembly will grant new Rights of Access by around 2005.

High Demand for Tir Gofal

Tir Gofal, the agri-environment scheme for farmers in Wales has attracted more than 1,200 applications this year and CCW is considering with the Welsh Assembly how to meet the demand. By March 2002, it is expected that there will be over 1,000 farms in the scheme and an average farm agreement is worth around £12,000 per year. The formally signed agreements have brought over 52,000 hectares of land into environmental protection. This includes:

3,400 hectares of broad-leaved woodland

2,700 hectares of blanket bog

1,500 hectares of fens, marsh and swamp

8,300 hectares of unimproved acid grassland

In addition over 113,000 metres of hedges have been restored and 19,000 metres of dry stone walling have been erected.

Access for educational visits has been agreed on 91 farms and over 250 km of new permissive paths have been created.

Xanthocyparis vietnamensis

Following on from the Fellows lecture, where Phillip Edwards referred to the biodiversity of Cambodia, Kew Scientists have discovered a new species of conifer - a missing link between true cypresses - (*Cupressus*) and the false cypresses (*Chamaecyparis*).

It was found in a remote area of northern Vietnam in ridge-top forest of extraordinary biodiversity. There are only about 630 living species of conifer so each new addition is significant. This with the Wollemi pine recently described from New South Wales, is the only such discovery since 1948.

New World Heritage Map

The UNESCO World Heritage Centre has announced the availability of the 2001 map showing all 690 World Heritage Sites. This can be ordered from: World Heritage Map, UNESCO World Heritage Centre, 7 Place de Fontenay 75352, Paris - specify the language required - English, French or Spanish and include an address label - could be just that unusual Christmas present that you have been looking for.

Scottish Capercaillie Conservation

The Scottish capercaillie population is in serious decline from over 20,000 birds in the 1970's to less than 1,000 now. The main reason for this is thought to be climatic - a number of cold, wet springs has reduced breeding success. It has also been estimated that deaths as a result of fence collisions account for 50% of juvenile mortality and 8% of adult mortality. The bird is protected under the EU Birds Directive and in January, 2001 the European Commission commenced proceedings against the UK in relation to the threat posed by forest fencing and the lack of SPA designation. Rhona Brankin, the Deputy Minister for Rural Development in the Scottish Parliament has announced the allocation of £700,000 to the Forestry Commission. This will allow the removal or marking of deer and stock fences within very high risk and high risk areas and there will be an effort made on predator control. Further details are available from Kenny Kortland, Capercaillie Species Action Plan Project Officer, Tel: 01463 715000; Fax: 01463 715315; Email:kenny.kortland@rspb.org.uk

The Jungle of the Law: New Legislative Instruments in Scotland

Scottish Section Conference Edinburgh, 11-12 October 2001

Una Urquhart FIEEM

This successful conference encompassed a wide range of new and on-going changes to the laws affecting the environment in Scotland. David Jamieson, IEEM Scottish Section Convenor, reminded us that these laws affect all of us, either in a professional capacity or simply when we enjoy the outdoors at leisure.

On the first day, David Hill, IEEM President, made the journey north to give us an introduction to the Countryside and Rights of Way (CRoW) Act, which applies only to England and Wales, not to Scotland (nor does it apply to N Ireland). We were particularly interested in the stronger penalties which English courts might impose for wildlife crime.

From our next speaker, Lloyd Austin (RSPB), we learned the similarities and differences between the CRoW Act and the Draft Land Reform Bill in Scotland, which is likely to be finalised in the very near future. Part of the Land Reform Bill is concerned with SSSI reform. A recent study has shown that around half of a random sample of SSSI's in Scotland suffer damage. For the first time since the Wildlife & Countryside Act (1981), it is proposed that public money should no longer be available as compensation to an owner for not carrying out operations which might damage the SSSI. Instead, just two days before our conference, the Natural Care Scheme was announced. Under this new scheme, money will be available for positive management.

Nigel Smith (SNH) continued this theme by providing some details. For instance, one of the main objectives of the Natural Care Scheme is to establish conservation as a legitimate land-use in an SSSI. In his update on the implementation of Natura 2000 in Scotland, in an entertaining way he explained the complexity of SPAs and SACs, for which the UK target is still incomplete. There are still gaps in the list of SPAs and candidate SACs in Scotland, especially in offshore marine sites.

The progress with Land Reform Legislation was described by Andrew Thin. Among several major changes proposed, the introduction of National Parks in Scotland had already been considered in detail by the Scottish Section at our Loch Lomond conference earlier this year. Andrew provided the written text of his talk, from which I have selected the following paragraphs:

"Throughout the 1980s, and with increasing emphasis into the 1990s, there was a growing popular unease in Scotland about the power of large and often absentee landowners, and the reluctance of a Westminster based government to address these concerns.

Legislation on Countryside and Natural Heritage Issues intends to provide a right of responsible access for informal recreation and passage across enclosed and unenclosed land ... to reform the SSSI system, and to create National Parks in Scotland.

Agricultural Holdings Legislation intends to ... better enable tenants to

develop woodland or gain compensation for game damage and mineral exploitation.

The importance of land reform goes well beyond its purely statutory elements. Welcome though legislative change generally is, the real impacts lie in the effects that land reform has on public policy, and in the changes in attitude that land reform demands from landowners, tenants and other members of the rural community."

In the discussion which followed, there was debate about the possible negative consequences of the proposed change in crofting rights. The possibility of crofts becoming larger units might result in the loss of the characteristic strip-cultivation system which gives rise to the machair communities. However this would depend on the extent to which become owner-occupied or amalgamated. Finally, we were greatly entertained by Nigel Smith's apparent "clarification" of SPAs, cSACs and eventual full SACs and their order of precedence in the Birds and Habitats Directives. Some of us are still puzzled!

Our second day began with a description of the new access legislation from Daniel Gotts MIEEM. The proposals for access in the Land Reform Bill are hotly debated. The most major change is in the proposed right of access for individuals and groups, at any time, over land and water. The Draft Outdoor Access Code will encourage responsible access.

Another specific example of legislative change is the Water Framework Directive, which was explained to us by Kathy Dale MIEEM (who replaced the programme speaker at very short notice). The EU Water Framework Directive came into force on 22 December 2000 and its provisions must be translated into Scots law within three years. There are two key components of the Directive. Firstly, the creation of River Basin Management Plans will encompass wider areas than catchment management plans. Three River Basin Districts are proposed for Scotland. Secondly, a major change includes habitat quality as an objective alongside the objectives of water quality. As at present in England & Wales, licences will now be required in Scotland for abstraction and impoundment of water.

From SWT, Lisa Schneidau gave an NGO perspective. NGO's work closely on the ground with local communities and they are largely concerned with translating new legislation into reality. In a change from being perceived as buying reserves solely for conservation, SWT are now developing reserves as examples of land management contracts.

Our final speaker was Sandy Cameron of the Scottish Executive, who rushed to our conference from Brussels that morning. His talk stimulated much ensuing discussion about the presentation of environmental information to a wide variety of audiences. His view is that change must come about not only through legislation but also through democracy as members of the public (including ourselves) take responsibility for our non-environmentally friendly behaviour.

In summing up, I noted that each speaker had provided a wealth of detail for a variety of professional interests, whether in the actual wording of a bill, the wider implications, the timescale or the amount of money available for a particular scheme.

The strongest common word throughout the conference was "responsible", particularly in the need to encourage responsible access in Scotland. Both days elicited a lively debate, showing that the subject of the conference holds significant interest for many areas of ecology and environmental management.

Dr Una Urquhart FIEEM, is Director of Marchfield Ecology, Aberdeen

Discussions with other Institutions

Alex Tait, MIEEM Vice- President

From time to time In Practice has included short notes reporting the discussions that are being held with a group of Institutes representing about 25,000 members professionally involved in environmental work with a view to creating an 'umbrella' body able to coordinate and promote the views of the profession. It is also possible that this umbrella body could provide a 'fast track' route to individual chartered status for members of the cooperating institutes, probably under the title of Chartered Environmentalist.

Progress has been slow because of the difficulty in reaching a consensus on the scope of the umbrella body and the degree of independence of the constituent institutes. Suggestions have ranged from a full merger and radical restructuring of all the institutes into a single completely new institute with a large secretariat and centralised office, to a more modest proposal for cooperation and mutual support between institutes that retain their independence and the ability to represent the views and interests of their particular constituencies - their memberships. Your Council has taken the latter view and Jim Thompson and I have articulated this at the meetings. The 'modest proposal' has prevailed with the hope that if the simple beginning is successful the 'umbrella' body may, in due time, evolve into a more substantial organisation – perhaps a Society for the Environment.

Now that the basic form of the new body has been settled positive progress is being made and all the institutes (including IEEM) have signed a Statement of Intent confirming the desire to seek closer cooperation in future. A copy of the Statement, plus a list of the institutes involved, is included in this Bulletin - further progress will be reported in future issues.

CUBE – A Step In The Right Direction

10 leading environment organizations have agreed the formation of an **Umbrella Body** for the **Environment**.

Under the Chairmanship of Dr. Michael Romeril and latterly William Pope of the Institution of Environmental Sciences, we have now agreed a Statement of Intent, which is reproduced on this page.

Membership of the new body will remain open to qualifying environmental organisations, the present membership of the group is therefore expected to increase and this will be encouraged. The current list of constituent bodies is as follows:

| | |
|---|-------|
| Chartered Institution of Water and Environmental Management | CIWEM |
| Institution of Agricultural Engineers | IAGrE |
| Institute of Ecology and Environmental Management | IEEM |
| Institute of Environmental Management and Assessment | IEMA |
| Institution of Environmental Sciences | IES |
| Institute of Fisheries Management | IFM |
| Institute of Professional Soil Scientists | IPSS |
| Institute of Wastes Management | IWM |
| Institution of Water Officers | IWO |
| Royal Meteorological Society | RMS |

STATEMENT OF INTENT

We are exploring the concept of an Association of Professional Bodies recognised as an authoritative independent organisation representing members in all environmental disciplines. This we have designated temporarily as a "Chartered Umbrella Body for the Environment" ("CUBE") whilst we search for an appropriate title.

Our aim is to reach a formal arrangement for CUBE which will go beyond a simple co-ordination of our affairs; our first task as the Founder Constituent Bodies of CUBE shall be to agree:

- vision statement
- terms of reference
- a timetable

all based on the significant progress made by Founder Constituent Bodies to date.

We agree that:

- the identities and pre-eminence of our respective professional sectors must be preserved; CUBE shall embody mechanisms which bring us together under one umbrella, whilst at the same time allowing the identities of the constituent bodies to be maintained and their primacy and centres of specific excellence to be recognised and enhanced
- we shall continue to seek the inclusion in CUBE of other professional bodies which have a significant interest in the environment
- the final agreement shall be subject to the approval of our members, and we individually reserve the right to withdraw from this process.

We shall ensure that the outcome of this process will add value to the service and support of our members and not add unnecessary burdens on membership fees.

We share the goal of establishing the qualification of 'Chartered Environmentalist', or an equivalent designation, in addition to the existing opportunities for our members. Such a status would be achieved by a process comparable with those of other organisations that award Chartered Status to individual members. The criteria for "Chartered Environmentalist" will be based on:

- education
- training
- experience
- professional and ethical conduct.

This qualification will be awarded under the auspices of CUBE which will be the custodian of the Charter.

It is important that all members of constituent bodies are encouraged to participate in the affairs of their constituent bodies and hence, the new body itself, thus assisting in the delivery of the agreed Vision Statement, which will embody our aims and aspirations. We will continue to seek to exploit opportunities to arrange joint meetings and activities for the mutual benefit of our members.

We aim to progress discussions as quickly as possible and in accordance with the agreed timetable.

We shall seek to have this Statement of Intent endorsed by our respective Councils at the earliest opportunity and in any case not later than 31st December 2001; in the meantime the Founder Constituent Bodies intend to continue progress towards the formation of CUBE.

Institute News

Sue Bell is the new President-elect

Sue Bell is to be warmly congratulated on becoming President-elect at the AGM in Torquay. Dr David Hill continues as President for a further year and Alex Tait, Sue Bell and Colin Buttery were re-elected to their previous positions for a further year. The new members of Council are also listed below:

President Elect - Ms Sue Bell BSc, MSc, MIBiol, MIEEM

Sue has over 14 years experience gained with the statutory agencies, voluntary sector and latterly consultancy. From a first degree in ecology, Sue worked for the Nature Conservancy Council. Initially she assisted area staff before moving to the freshwater loch survey team where she helped to devise the standard survey and evaluation method.

Sue next studied for an MSc in water resources management. Her thesis explored the use of macrophytes as indicators of pesticide pollution and was conducted in Canada. She then moved to the Marine Conservation Society. She was responsible for promoting the Society and developing policy on fish farming, coastal zone management, protected areas and EIA. She has been a consultant for 8 years. Her remit is broad and includes aquatic management projects, public participation and EIA. Sue has been Secretary and a Director of IEEM since 1999.

President (IEEM Company Director)

Dr David Hill, MA, DPhil, FIEEM, Managing Director Ecoscope Applied Ecologists

Vice- President (IEEM Company Director)

Dr Alex Tait BA, DPhil, MIBiol, MIEEM, County Ecologist, East Sussex County Council

Secretary (IEEM Company Director)

Ms Sue Bell BSc, MSc, MIBiol, MIEEM, Principal Environmental Specialist, Scott Wilson Resource Consultants, Edinburgh. (Sue Bell holds the posts of Secretary and President-elect concurrently, as is allowed under the Constitution)

Treasurer (IEEM Company Director)

Mr Colin Buttery BSc, MIBiol, MILAM, MIEEM, Head of Parks and Leisure, Westminster City Council.

List of Council Members elected:

Mr Mike Barker Environment and Product Quality Team Manager, Southern Water Services Ltd

Dr Peter Beale Director, Sunflower International Ltd

Dr Tim Bines Area Manager, English Nature

Dr John Box Principal Environmental Scientist, Wardell Armstrong

Prof. Tony Bradshaw Emeritus Professor, University of Liverpool

Dr Robin Buxton Chairman, Northmoor Trust

Dr Nick Carter* Director of Development, British Trust for Ornithology

Ms Kathy Dale* Senior Ecological Consultant, Northern Ecological Services

Dr Steve Gibson International Adviser, Joint Nature Conservation Committee

Mr David Jamieson Director, BTCV, Scotland

Ms Hilary Ludlow Ecologist and Landscape Scientist, The Landscape Science Consultancy

Mr Will Manley Countryside Management Research Consultant, Royal Agricultural College

Mr Steve Pullan *Project Officer, Department of Environment, Food and Rural Affairs

Dr Eirene Williams Principal Lecturer, University of Plymouth, Seale Hayne

* elected for the first time

The 2002 Professional Development Programme

The new programme has now been produced and contains the largest number of courses ever including about 15 new topics. Some of the old favourites have been retained, especially grass identification for which the demand is always substantial. The Institute is enormously grateful to all those who will be acting as tutors or facilitators and to Robin Buxton and Peter Beale for their work in drawing together the programme. A number of people offered courses which have not been included and we are also grateful to them. These may be included in future programmes.

Committee Matters

There are still opportunities and indeed a great need for further nominations to the Committees especially the Membership Admissions Committee and the Finance and General Purposes Committee so if you were considering volunteering do get your nomination forms signed and sent into the office.

Membership Subscriptions

Membership renewals were due on the 1st October but there are still a number outstanding. Do please sign chase Final reminders will be sent out very shortly and this will be the last In Practice which those who have not renewed will receive.

Conferences for 2002

Council at its meeting on 27th November reviewed the arrangements for the Conferences in 2002. Council thought that the theme of **Urban Ecology** required a full two days and so this has been put back to the Autumn and will now be held in the Newcastle Area. There are plenty of good examples of urban ecology and restoration work in the area and it is hoped that this will also attract a good attendance from Scotland. Members north of the Border on the whole found the trip to Torquay a bit too far. The other idea behind holding it in the Newcastle area is that it will also mark the formal launch of the next Geographic Section - the North East.

The next 1-day Conference will be held in Birmingham on 11th April 2002 with the theme of **Ecological Impact Analysis**.

Members will be aware that there is a group which has been working strenuously on this topic headed by Karen Regini. The Conference in Torquay featured a session on this work led by Karen with Mike Oxford. The progress which has so far been achieved is posted on the IEEM website and comments are welcome. This work is of fundamental significance but it is absolutely critical that whatever procedures may be adopted and endorsed by IEEM, they carry widespread acceptance and that they can be applied within the existing legal framework. The intention is that the day in Birmingham will feature outside contributions as well workshops and will carry the process forward to a conclusion.

The IEEM Constitution

More likely to be greeted by groans than enthusiasm this rather long running issue was also considered at Council. The current Constitution, which has had only minor changes in the last 10 years, is in need of an overhaul to bring in recent changes in Company Law and to reflect the way in which the business of the Institute should be carried out. Also the Institute is pursuing Charitable Status and this may require Constitutional changes. Certain phrases in the Constitution tend to give a distorted impression of the Institute rather than reflecting what it actually does. It is intended to put the new Constitution to an EGM which will be held on April 11th at the Birmingham Botanical Gardens at 16.30 or thereabouts at the end of the 1-day Conference in Birmingham.



Christmas and New Year



Members of Council, the Directors and Secretariat would like to wish all members a Happy Christmas and a productive and ecologically active year in 2002.

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

Centre for Alternative Technology: Further details about each course can be obtained from Joan Randle,
Tel: 01654 703743, Fax: 01654 703605, E-mail: joan@cateducation.demon.co.uk.

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

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

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

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

9 January. IEEM NorthEast Section, Ecological Assessment - Dr David Hill, President, IEEM

Durham Wildlife Trust, Rainton Meadows, Chilton Moor, Houghton-le-Spring Durham DH4 6PU **7.30pm.**

Details from: Steve Pullan, MIEEM 20 Holystone Drive, Holystone, Newcastle upon Tyne NE27 0DH.
Tel: 0191 2661769 Email: steve.pullan@virgin.net

17 January. The URGENT programme: Chemistry and Sustainability of the Urban Environment, SCI HQ Belgrave Square, London.
Details from SCI 14/15 Belgrave Square, London SWX 8PS.
Tel: 020 7235 3681.

22 January. A vision for our Common Future: The UK's Contribution to Earth Summit 2002, The Brunei Gallery, SOAS, Russell Square, London.
Details from: UNED UK, 3 Whitehall Court, London SW1A 2EL
Tel: 020 7839 1784, Fax: 020 7930 5893,
Email: info@earthsummit2002.org

23 - 24 January. Coastal Futures 2002 Review and Future trends, SOAS, Russell Square, London.
Details from Bob Earll, CMS, Candle Cottage, Kempsey, Glos. GL18 2BU.
Tel/ Fax: 01531 890415,
Email: bob.earll@dial.pipex.com.

6 March. IEEM NorthEast Section, Regeneration of industrial sites: 30 years on, what lessons can be learnt - Dr David Mitchell, MIEEM
The Rising Sun Countryside Centre, North Tyneside **2.00pm**
Details from: Steve Pullan, MIEEM, 20 Holystone Drive, Holystone, Newcastle upon Tyne NE27 0DH.
Tel: 0191 2661769, Email: steve.pullan@virgin.net

12 March. Soil protection Strategy: implications for the agricultural and environmental sectors SCI HQ, London.
Details from SCI 14/15 Belgrave Square, London SWX 8PS.
Tel: 020 7235 3681.

13 March. An overview of BS 10175:2001: Investigation of potentially contaminated sites - Code of Practice SCI HQ, London.
Details from SCI 14/15 Belgrave Square, London SWX 8PS.
Tel: 020 7235 3681.

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

11 April. Ecological Impact Analysis - IEEM Conference
Location: Birmingham Botanical Gardens
Details and Booking Forms available later from IEEM Office.

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

17 April. Great Crested Newts - Survey, handling, licences and the law.
IEEM Professional Development Programme: Details from IEEM Office.

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

25 April. Translocation of Great Crested Newts.
IEEM Professional Development Programme: Details from IEEM Office.

1 May. Water Voles, Barn Elms, London
IEEM Professional Development Programme: Details from IEEM Office.

16 May. Using Bryophytes as habitat indicators, Orpington, Kent
IEEM Professional Development Programme: Details from IEEM Office.

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

15 June. Francis Rose and his contribution to British Botany: 80 Birthday Conference, Reardon-Smith lecture theatre, National Museum of Wales, Cardiff.
Details from: Dr Tim Rich, Department of Biodiversity and Systematic Biology, National Museum & Gallery, Cardiff CF10 3NP.
Tel: 02920 573218, Fax: 02920 239829, Email: tim.rich@nmgw.ac.uk

27 & 28 November. IEEM Annual Conference and AGM - Urban Ecology.
Location: Newcastle Area
Details and Booking Forms available later from IEEM Office.