



Biodiversity by design

► BIODIVERSITY IS NOW A CENTRAL THEME WITHIN THE PLANNING AND DEVELOPMENT CONTROL PROCESS, LARGELY BECAUSE THE DIVERSITY AND ABUNDANCE OF WILDLIFE IN THE UK HAS DRAMATICALLY DETERIORATED OVER THE PAST 50 YEARS. HERE, **DR DAVID HILL**, DIVISIONAL DIRECTOR FOR ENVIRONMENT AND DIRECTOR OF ECOLOGY FOR THE RPS GROUP PLC, EXAMINES THE WAY DEVELOPMENT MITIGATION IS DELIVERED, AND ASSESSES THE POTENTIAL FOR NEW INITIATIVES SUCH AS MITIGATION BANKING WHICH COULD DELIVER LARGER-SCALE WILDLIFE HABITATS DESIGNED TO STITCHBACK THE FABRIC OF OUR COUNTRYSIDE

As I write this piece, sitting amongst the Yorkshire Dales, the swallows have just arrived back to breed again in our stable, the celandines are showing in the hay meadows and the dippers are feeding their first brood of young on the river. Spring is here and, after a long winter, we can once again appreciate the splendour of the biodiversity that fills our lives.

But what we see in our countryside today is but a shadow of what existed only 50 years ago. Landscapes and biodiversity have changed much over the centuries. From the time of the receding ice sheets over 8000 years ago, biodiversity has been modified by man and has generally declined to its present, relatively impoverished state today as a result of factors such as forest clearance, hunting persecution, urbanisation, industrialisation, farming intensification and the resultant pollution of an expanding human population.

A LEGACY OF FAILURE

The legacy of the failure to mitigate for the land use changes of the past are evident from statistics on the biodiversity resource. Since the Second World War, Britain has lost 50 per cent of its ancient lowland woodland, 150,000 miles of hedgerows, 95 per cent of traditional hay meadows, 80 per cent of chalk downland and 80 per cent of wetland fens and mires. Five species of wildflower are lost per county every 10 years, five species of butterfly have become extinct since the 19th century, 500 species of invertebrate are classed as endangered, most species of amphibians are in decline, eight of the 16 bat species in the UK are now endangered or rare, and since the 1970s, some 52 per cent of Song

Thrushes, 54 per cent of Skylarks, 94 per cent of Tree Sparrows, 87 per cent of Starlings and 89 per cent of Corn Buntings have been lost. Alongside these declines, 42 per cent of the one million or so hectares of SSSIs are considered to be in Unfavourable Condition, as are 69 per cent of rivers and streams, 65 per cent of upland grassland and heaths, 35 per cent of fen, marsh and swamp, and 33 per cent of lowland broadleaved woodland. If we ran a business as we run biodiversity conservation, we would have been bankrupt years ago.

MAINTENANCE AND ENHANCEMENT

Biodiversity not only enriches our lives – without it of course we could no longer exist on our planet. Maintenance and enhancement of biodiversity is therefore, without question in my view, of utmost importance and we should use the full range of measures at our disposal.

One of these measures is using the planning and development control process. The usual sequence of events is as follows: a developer wants to promote a scheme and must undertake an environmental impact assessment and submit an Environmental Statement. Through a period of consultation the scheme is evaluated by the local planning authority and either accepted or rejected. Where there are potential sensitivities in respect of ecology and nature conservation, the EIA will have encompassed an ecological assessment. Depending on the scale of the scheme proposals and its siting in relation to the location of any ecological features or resource, the assessment of impacts may lead to proposals for mitigation, or compensation in the event that significant residual impacts remain. All of the various

factors will be taken into account by the planning authority in coming to a decision. In many cases, the scheme may be allowed subject to certain conditions. It is commonplace to find a range of ecological-mitigation measures being made the subject of a Section 106 agreement, which, in theory, should ensure that the ecological feature or resource remains unaffected.

THE GAP BETWEEN THEORY AND PRACTICE

Mitigation for ecological impacts can take many forms, from direct avoidance of the ecological features through relocation, translocation or habitat creation and enhancement (eg: restoration or re-instatement). The gap between theory and practice, however, is vast. I have seen many schemes that propose an array of ecological-mitigation measures at the application stage, only to find these schemes watered down or abandoned in respect of their commitments to ecology. This is a failure on the part of the ecological profession and a failure on the part of the development community which, in the long run, will make development more difficult in the future. Attention to detail at an early stage of the process and a commitment to proper funding of an ecological-mitigation scheme is the only way to ensure that biodiversity is not further impoverished as we exercise our impacts or 'ecological footprint' on our planet.

More attention is now given to better design of mitigation schemes to retain and enhance biodiversity resources. The following table describes a range of initiatives for habitats and species that aim to increase the biodiversity resource, with an indication of the successes that can be achieved and the common pitfalls:

Habitat type or species issue	Initiative	Potential success	Pitfalls
Wetlands	Wetland creation; re-wetting dry areas; wet woodland	Relatively high	Hydrological conditions; water budget; water-level control; long-term funding
Heathland	Creation or restoration	High	Creation – nutrient-rich soils; not free-draining; seed provenance; persistence of invasive species; degree of any 'improvement'; long-term funding & management
Coastal grazing marsh/saltmarsh	Arable or grassland reversion to saltmarsh and brackish marsh	Relatively high	Water-level controls; extent of area – the bigger the better; long-term plan needed for management; freshwater supply for brackish marsh; as for coastal grazing marsh will require supply of livestock
Reedbed	Creation or restoration	Moderate	Depends on source of fresh water; deep-ditch system usually required; long-term commitment to funding & management, eg: regular cutting required; local provenance – pot-grown plants or rhizome introduction required; water-level maintenance is crucial
Woodland	Creation of new woodland	High	Lack of ground flora because too nutrient rich; native species – use species local to the area. It takes a considerable time for a new broadleaved plantation to become ecologically functioning
	Woodland management	High	Early attention to large-scale intervention management required
Wildflower meadows	Creation or Restoration	Moderate	Soil nutrient status; selection & source of seed; aftercare management can determine succession of grassland species and remaining community which may be very different to that planned by seed composition
Badger	Sett relocation	Moderate	Length of time needed to create new sett; badgers give up and move elsewhere; need to have enough foraging habitat to support population
Great crested newt	Translocation	Moderate-high	Enough foraging habitat is needed to support area of new newt wetland habitat; excessive cost of capture and translocation exercise; long-term monitoring required
Water vole	Translocation	Limited	Voles have high population turnover – receptor site habitat may be constructed but animals taken into captivity ready for re-release in new habitat can die beforehand; capture and keeping of individuals is labour intensive

woodlands, forests, heaths, moors and grasslands can also be provided, managed or restored by Mitigation Banking. In the US, Mitigation Banking is a thriving industry and the early problems of poor design, bad engineering and hydrology have now been largely resolved. In the UK, there is no industry as yet since such mitigation is not required by law. The key conservation laws in the UK are implemented on a piecemeal basis through seeking to inhibit development. However, there are signs that English Nature may look more favourably on such an innovative approach, particularly where a proponent has demonstrated that the development has no alternatives and that there are imperative reasons of overriding public interest.

If we think big and act quickly, we might just be able to reverse biodiversity loss and pass on a planet, to future generations, that is better than the one we inherited. Not only is that worth doing, but failure to do it will be catastrophic.

CASE STUDIES

HIGHWAYS AND BIRDS – This project aimed to collate all available knowledge on design features to ensure either that birds avoid carriageways and hence resultant mortality, or that habitats provided by the Highways Agency in its 'soft-estate' (re non-carriageway land), are conducive to birds. Features can be designed into schemes, such as ecoducts or green bridges, which connect together landscapes that may otherwise be severed by a road; nesting boxes for kestrels where these birds of prey can exploit small mammal populations along wide road verges without coming into the path of vehicles; and use of off-site habitats such as scrub areas, woodlands and wetlands, benefiting a range of wildlife species. All of these features have been written up as a book of best-practice guidance (available from the author).

MANAGEMENT PLANNING – Management plans are an important tool for designing mitigation to retain biodiversity. In association with a major retail scheme we produced a plan for the long-term restoration of the Trentham Gardens estate in Staffordshire, which has come under the ownership of the St Modwen Group. Although the retail scheme was separate to the wider 400ha estate, a mitigation scheme incorporated restoration and enhancement of habitats under the new client's ownership, including a superb ancient woodland SSSI, designated on the basis of its important saproxylic (dead wood) invertebrate populations. Other important habitats on the estate included wood pasture (at the time being impacted by a caravan park) heathland (being seriously affected by 4x4 vehicles) and fen swamp which needed hydrological and vegetative management to improve its biodiversity value. The ancient woodland had become invaded by Himalayan balsam, bracken, rhododendron and Japanese knotweed, affecting its condition. The compartmentalised management plan incorporated a detailed restoration scheme for the successive removal of the invasive plants, returning the woodland back to its state at the time Capability Brown was involved in the creation of the woodland rides. Each of the other habitats will be similarly managed to restore and then retain their biodiversity value under a long-term commitment to management and funding. The glory of the Trentham Estate will eventually be restored

DELIVERING PROMISES

So, although few research papers are published on the efficiency, success and failure, of mitigation schemes, in general terms some actions taken can be implemented successfully, whereas many others are far less secure.

One of the main problems with the whole concept of mitigation is the lack of proper enforcement and monitoring. Planning authorities must devote time and resources to ensuring that what is promised by developers is delivered. It is presently woefully inadequate. Only by measuring the success of schemes can we hope to improve mitigation design and ensure that the biodiversity which is so important for our future is passed on to future generations.

We spend a substantial amount of money in the UK on poorly designed mitigation schemes, on too small a scale, in the wrong places, with untried and untested methods, on insecure sites, based on inadequate research, without an appreciation of historical context and potential, with insufficient funds

and no management commitment. An alternative could be to investigate the nationwide application of Mitigation Banking as a means of delivering mitigation and compensation schemes at a scale appropriate to improving the biodiversity benefits and under a more regulated and consistent framework which developers can understand.

THINK BIG AND ACT QUICKLY

A Mitigation Bank is not really a bank but an entity that restores, creates, enhances or preserves, for example, a wetland habitat. The entity sells tangible units of habitat, termed credits, to a developer for compensation for equivalent units that a developer has destroyed, termed debits. The advantages of Mitigation Banking are that large, ecologically superior and robust habitats such as wetlands can be and have been created; there are economies of scale through structured and efficient habitat regulation which encourages watershed-based wetland planning; and other habitats such as