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Integrated Water Management
in the National Trust

Biodiversity Gains from
Compensation Wetland
in Hong Kong

Sustainable Restoration of
Freshwater Ecosystems:
The Eddleston Water Project

Do UK Survey Licences for
Otter Support Best Practice?

Water and Ecology

Meeting the Challenges of Evidence-based Ecological Consultancy



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Recommending and implementing practices to mitigate and compensate for the impacts of development on biodiversity are the bread and butter of ecological consultancy. In a time of unprecedented biodiversity loss it is more important than ever that such interventions are demonstrably effective in achieving positive conservation outcomes. In this opinion piece by the CIEEM Academia Special Interest Group we question whether this is the case and challenge the profession (including ourselves) to do better.

Practising ecological consultants employ a library of guidance documents to support their advice and actions to mitigate and compensate for impacts on protected species and habitats. Familiarity with this guidance is a preoccupation for career development in consultancy, and a review of any handful of commercial ecology reports will likely reveal the same standard citations provided as

evidence for best practice in relation to a range of taxa. Furthermore, adherence to this body of guidance is expected by local authorities, Statutory Nature Conservation Bodies (SNCBs) and commercial clients, and hence a network of key stakeholders is invested in this approach. But just how much of this guidance is based on sound evidence?

A landmark opinion piece by Sutherland *et al.* in 2004 described how conservation practice was all too often based on anecdote rather than on a clear understanding of the evidence for the effectiveness of measures. The authors advocated the adoption of evidence-based conservation practice, following in the footsteps of the successful incorporation of systematically evaluated evidence into clinical practice in human medicine. Evidence-based approaches advocate the use of a range of relevant information to inform decisions on interventions and thereby improve outcomes. There are different kinds of evidence, including the results of scientific studies, practitioner experience and expert opinion, and their effective incorporation into the decision-making process requires that their relative strengths are understood and communicated.

So how well are ecological consultants doing in rising to the challenge of evidence-based practice? Sadly, there is mounting evidence that routine practices in the industry are often underpinned by inadequately evidenced guidance or even no evidence at all (e.g. Sutherland and Wordley 2017, Downey *et al.* 2022). The effectiveness of many ecological mitigation and compensation measures, for example, has not been formally assessed, and instead best (or

good) practice is frequently dictated by anecdote and opinion which becomes 'received wisdom'. A recent detailed assessment of a sample of ecology reports submitted in support of planning applications identified 446 recommendations relating to 65 different measures, 56% of which were informed by guidance but with only 10% of the cited texts including empirical evaluations of their effectiveness (Hunter *et al.* 2021). Hence, the majority of measures recommended by consultant ecologists were not demonstrably based on robust evidence. Some studies of the available evidence have concluded that routinely practised mitigation interventions may even have counter-productive outcomes.

One study of the impact of bat derogation licences issued in relation to 1776 roosts in England reported an overall negative outcome for conservation (Stone *et al.* 2013). A more recent analysis of data from routine mitigation measures implemented to compensate for the loss of bat roosts on 71 development sites showed that following the interventions bat abundance and richness had either been maintained or improved in fewer than half of those sites (Collins *et al.* 2020). Reptile translocations are another widely practised mitigation intervention and yet there is little evidence to support their effectiveness (Germano *et al.* 2015). In a recent example of one of the very few UK studies of this practice, the poor recovery of translocated reptiles across six sites was attributed to dispersal away from the receptor site, suggesting that these interventions may not be adequately compensating for the loss of populations to development (Nash *et al.* 2020). Similarly, a systematic review of evidence from great crested newt mitigation activities at development sites found no conclusive evidence for their effectiveness in maintaining populations, whereas follow-up surveys at 18 sites identified post-mitigation population declines (Lewis *et al.* 2016). It would appear that practices based on little or no reliable evidence are widely recommended and implemented, with largely unknown consequences. Perhaps even more concerning is that some

approaches have continued to be used despite the availability of evidence that demonstrates they are ineffective (Sutherland and Wordley 2017). A case in point is the use of bat gantries which have been shown to be ineffective at providing routes of safe passage for bats over roads (Berthinussen and Altringham 2012). Given the scale at which the ecological consultancy industry operates, the consequences for biodiversity of implementing ineffective or even potentially harmful interventions are clearly significant. Furthermore, ineffective mitigation practices waste resources and undermine the professional standing of ecological consultants.

There are many reasons why ecological consultancy finds itself in this troubled state. Consultants operate in an environment where mitigation and compensation measures are a legal requirement to reduce or offset the impacts of development on biodiversity. The SNCBs are therefore obliged to produce or signpost to sources of guidance, even where reliable evidence is in short supply. This evidence shortfall is further perpetuated by a dearth of post-intervention monitoring and commercial constraints which impede evidence gathering, such as insufficient time, money and the imperative to act. These circumstances have created inertia in the system and encouraged a formulaic reliance on existing guidance which is then used to 'instruct' rather than to 'guide' action. There may also be a cultural dimension to the problem as many (although not all) consultant ecologists who have not been trained as scientists (i.e. to PhD level) might be unfamiliar with how to access and critically appraise emerging scientific evidence. But even those consultants with the required skills and experience would likely struggle to justify spending the necessary time unless the cost of doing so was factored into projects.

In recent years there has been a growing recognition of these issues among ecological consultants and the SNCBs (see Natural England 2020), but what can we do to meet these challenges? Downey *et al.* (2022) list some principles for evidence-based practice, including the need to collate and review the available scientific

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evidence, to regularly update guidance and, when communicating recommendations, to be clear about the sources and strengths of evidence used to inform them. These are useful guiding principles but constraints on time and costs mean that incorporating them into the daily routine of ecological consultancy in a commercial setting is not easy. Nevertheless, these are challenges that the profession must face. So how do we find efficient ways for practising ecological consultants to access and use the expanding evidence base? A good place to start might be to raise the profile of existing sources of information on the effectiveness of conservation practices (e.g. www.conservationevidence.com/) and to provide training in how to recognise and assess different types of evidence. Consultant ecologists could also usefully be encouraged to consider some of the formal frameworks that have been developed to guide evidence-based decision-making (e.g. www.evidence2decisiontool.com/shiny/evidence2decisiontool/). These initiatives should help us understand how to use the available evidence more efficiently, although for many interventions there is little or no reliable information on their effectiveness. There is a clear need therefore for scientific trials to assess mitigation and compensation interventions. Although these will incur costs and may be time-consuming, given that many such interventions are being implemented routinely in connection with development projects, there is no shortage of potential opportunities to collect the necessary information. In some instances, post-intervention monitoring data may already exist but is dispersed throughout many separate reports, with the

potential for collation and analysis. The challenge will be to develop ways of working together with researchers in academia to make the most of these opportunities. Forging more avenues of direct engagement between ecological consultants and academia will help to foster new partnerships to deliver a better evidence base and ultimately better outcomes for nature.

The CIEEM Academia Special Interest Group (ASIG) is committed to playing its part in meeting these challenges. As a small voluntary group there are limits to what we can achieve but over the coming years we aim to showcase and signpost sources of evidence that may help practising ecological consultants, to encourage initiatives to train ecologists in how to assess evidence and use it to inform decision-making, and to facilitate discussion and collaboration between academics and practitioners. In the coming months we will be developing a programme of related actions, so if you would like to support us in this endeavour or have any suggestions then please get in touch (see About the Authors).

----- About the Authors

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