



# Ecological mitigation measures in English Environmental Impact Assessment

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## ARTICLE INFO

### Article history:

Received 17 July 2012

Received in revised form

16 November 2012

Accepted 14 December 2012

Available online 5 March 2013

### Keywords:

Biodiversity

Ecological Impact Assessment

Habitat creation

Monitoring

Planning

## ABSTRACT

Built development is one of the main drivers of biodiversity loss in the UK. Major built developments usually require an Environmental Impact Assessment (EIA) to be conducted, which frequently includes an Ecological Impact Assessment (EclA) chapter. By identifying the flaws in EclA mitigation measure proposals and their implementation in completed developments, it may be possible to develop measures to reduce biodiversity loss and help meet the UK's EU obligation to halt biodiversity loss by 2020.

A review of 112 English EclAs from 2000 onwards was conducted to provide a broad-scale overview of the information provision and detail of ecological mitigation measures. Audits of seven EIA development case study sites provided finer-scale detail of mitigation measure implementation, and the effectiveness of their grassland and marginal habitat creation and management measures was assessed using standard NVC methodology.

Despite higher than expected levels of mitigation measure implementation in completed developments, EclA mitigation proposal information and detail has seen little improvement since a 1997 review, and the effectiveness of the habitat mitigation measures studied was poor. This suggests that measures to improve ecological mitigation measures are best targeted at ecological consultants. A recommendation for EclA-specific training of Competent Authorities is also made.

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## 1. Introduction

Built development is one of the main drivers of biodiversity loss in the UK (Land Use Consultants, 2005). The UK had an EU obligation to halt biodiversity loss by 2010 (Commission of the European Communities, 2001), which it failed to meet (Natural England, 2010; UK Biodiversity Partnership, 2010). As a consequence, UK biodiversity continues to decline. In order to help meet our new EU obligation to halt biodiversity loss by 2020 (European Commission, 2011), the flaws in the planning system that allow built development to continue to contribute to biodiversity loss need to be identified and remedied.

Built developments that meet the criteria in Annexes I and II of the EU's Environmental Impact Assessment (EIA) Directive (Council of the European Union, 1985, as amended) tend to be the largest and/or most damaging development types, such as major roads and power stations. It is these 'EIA developments' that are the focus of

this paper, being by definition the most likely to have potentially significant impacts on biodiversity.

Environmental Impact Assessment, or EIA, is a process that allows the potential environmental impacts of a proposed development to be determined and appropriate measures to avoid, reduce or compensate for those impacts (known as mitigation measures) proposed (Canter, 1996). The EIA report – the Environmental Statement (ES) – is submitted to the competent authority (CA) with the planning application for the proposed development and is a material consideration in the determination of the planning application. However, unless ES mitigation measures are included as conditions within the decision notice, or as obligations within Section 106 (S106) agreements, there is no legal requirement for them to be implemented.

The majority of ESs include a chapter relating to biodiversity, commonly known as an Ecological Impact Assessment (EclA). The preparation of EclAs is significantly aided by guidance, particularly the Institute of Ecology and Environmental Management's 'Guidelines for Ecological Impact Assessment in the United Kingdom' (IEEM, 2006), which incorporates legislative requirements and policy aims, and promotes and gives examples of best practice at each stage of the EclA process.

Between 1999 and 2008, an average of 341 ESs were submitted in England annually under the EIA Regulations (DCLG, unpublished

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data), with 390 submitted in 2011 (DCLG, 2012c). Although it is unknown how many of these EIA developments were granted planning permission, approximately 80% of all English planning applications between 2001 and 2011 gained planning permission (DCLG, 2012b). Underpinning this research is the assumption that the number of EIA planning applications is unlikely to change significantly in the future. The emphasis, therefore, must be on improving ECIAs to ensure that EIA developments' impacts on biodiversity are reduced as far as practicably possible.

Factors that contribute to the accuracy, comprehensiveness and usefulness of an ECIa range from adequate baseline data collection to effective report writing skills, and ensure that biodiversity impacts from a proposed development are minimised. Ecological mitigation, however, has been identified as one of the key areas requiring research in order to build an evidence-base for improving ECIAs and eventually reducing biodiversity loss in completed developments (Hill and Arnold, 2012).

Mitigation measures in ecology are subject to two main areas of uncertainty. The first is uncertainty as to whether they will be carried out appropriately (implementation uncertainty). In the ECIa chapter itself, implementation uncertainty can arise through vague descriptions for mitigation (Trewick and Thompson, 1997). Government advice on the use of planning conditions states that "conditions should only be imposed where they are...enforceable, precise and relevant...to the development to be permitted" (DoE, 1995). To maximise the likelihood of inclusion as conditions, mitigation measures should therefore include "details of physical size, layout, location; when the management is predicted to have maximum effect; and, where appropriate, confidence limits for the performance of the measure and a statement of the underlying assumptions" (DETR, 1997).

Implementation uncertainty can also arise from a lack of information on how measures could be implemented and managed (Trewick et al., 1993). It is not always clear which mitigation measures have already been agreed to by the developer (for example, green roofs will usually be included in the early design of a development and therefore implemented) and which are merely recommendations by the consultant. Indeed, an early study found that of 100 ESs (i.e. not just ECIAs), none could be classified as 'Excellent' in terms of mitigation commitment (DETR, 1997). The CA could therefore fail to recognise those mitigation measures for which conditions would be most appropriate. The end result is that not all of the mitigation measures included in the ECIa may be implemented in the final development (Tinker et al., 2005).

The second area of ECIa mitigation measure uncertainty is whether they will deliver the intended outcome (effectiveness uncertainty). An indication of effectiveness uncertainty should be expressed in the ECIa, for example by stating the likely success of the mitigation measure in meeting its objectives, assuming correct implementation (IEEM, 2006). Effectiveness uncertainty in terms of the completed development can result from a lack of, or poor, management. Some of the most commonly proposed and important ecological mitigation measures require many years of post-implementation management to be successful according to the aims outlined in the ECIa or ecological management plan (EcMP).

There have been few published studies of ECIa mitigation measure proposal implementation uncertainty. Several of these have focused solely on specific development types (e.g. Byron et al., 2000; Trewick et al., 1993) and none have been published in the past decade. One of the most comprehensive studies (and therefore used as a comparison in this study) highlighted major flaws in the mitigation measures described in ECIAs, such as poor descriptions of habitat mitigation measures (Thompson et al., 1997), which was confirmed in a study investigating a larger number of ECIAs (Trewick and Thompson, 1997). In terms of completed

developments, a study on ES (i.e. not just ECIa) impact prediction auditability found that almost a quarter of proposed mitigation measures had not been implemented and that for 19% of 'flora and fauna' mitigation measures, lack of information resulted in an inability to determine implementation (Wood et al., 2000).

There have been still fewer published studies on the effectiveness of ECIa mitigation measures. Even where monitoring of ecological mitigation measures is included as a condition or obligation, the results are rarely circulated (Hill and Arnold, 2012). The most comprehensive published study of ecological mitigation effectiveness in completed UK EIA developments was based entirely on road developments over a decade ago (Chinn et al., 1999). This is of concern, as it is only through the dissemination of monitoring results (both positive and negative) and research into implementation and effectiveness that practitioners can tailor and improve their mitigation recommendations. This will ensure that development impacts on biodiversity are reduced as far as possible, and could save developers money by implementing fewer but more effective mitigation measures.

Since the last published UK ECIa review (Byron et al., 2000), there have been important changes in policy and guidance. Planning Policy Statement 9 (ODPM, 2005b) and its accompanying circular (ODPM, 2005a) provided guidance on incorporating biodiversity into decision-making. For practitioners, the ECIa Guidelines (IEEM, 2006) filled an information gap identified as contributing to the poor quality of ECIAs (Spellerberg and Minshull, 1992; Trewick et al., 1993). This research examines whether ECIa mitigation proposals have significantly improved since the Thompson et al. (1997) review. We also determine the possible factors contributing to low implementation rates and poor habitat mitigation effectiveness. We show that commonly held opinions amongst ecological consultants about the reasons for low implementation rates and habitat mitigation measure effectiveness are not necessarily correct, and suggest potential solutions for practitioners.

## 2. Materials and methods

To analyse issues with implementation and effectiveness uncertainty, two separate methodologies were used (see Fig. 1). The first involved a review of mitigation measures in 112 ECIAs, which provided broad-scale information (see Section 2.1). The second involved the analysis of seven case study sites from a variety of development sectors, which provided finer-scale information about the implementation and effectiveness of ecological mitigation measures (see Section 2.2).

### 2.1. Ecological Impact Assessment review

ECIAs were gathered from a variety of sources, including CA websites, internet searches and environmental consultancies. In each case, the status of the planning application was determined by consulting the CA website or corresponding directly with the CA. Only ECIAs for projects that were granted planning permission were included in this study. Planning permission implies that the ECIa has been reviewed by the CA and the statutory and non-statutory consultees, and so any issues raised in this study indicate general failings in the planning system.

Further information on the criteria used to select ECIAs for this study is provided in Table 1. In total, 112 ECIAs were analysed from 37 counties across England. In the absence of a centralised database of EIA applications, it is assumed that the ECIAs analysed are representative of the applications submitted during that time period and that a sample of over 100 allows sufficiently robust conclusions to be drawn (DETR, 1997).

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