

Guidelines for ecological impact assessment in the United Kingdom

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Abstract. These Guidelines have been developed by the Institute of Ecology and Environmental Management (IEEM) to promote good practice in Ecological Impact Assessment (EcIA) for terrestrial, freshwater and coastal environments to the mean low water mark in the UK. EcIA is the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components. EcIA may be carried out as part of a formal environmental impact assessment (EIA) or to support other forms of environmental assessment or appraisal. A common framework for EcIA will help promote better communication and closer cooperation between all ecologists involved in the process.

The IEEM guidelines were launched in 2006 and the key issues are: (i) seeking biodiversity enhancements from the start of the EcIA process; (ii) the value of ecological features which can comprise biodiversity value, social/community value and economic value should be determined within a defined geographical context; (iii) legal protection should be separated from biodiversity value; (iv) significant ecological impacts depend on positive or negative effects on the integrity of defined sites or ecosystems and the conservation status of habitats and species.

Key words: Ecological Impact Assessment, good practice, Guidelines, biodiversity, United Kingdom

1. Introduction

Ecological impact assessment (EcIA) is the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components. If properly implemented, it provides a scientifically defensible approach to ecosystem management (Treweek 1999).

The Institute of Ecology and Environmental Management (IEEM) has developed and published its *Guidelines for Ecological Impact Assessment in the United Kingdom* which relate to terrestrial, freshwater and coastal environments to mean low water mark with the objective of promoting a scientifically rigorous and transparent approach to EcIA. The Guidelines provide a common framework for EcIA in order to promote better communication and closer cooperation between all of the ecologists involved in any EcIA – whether working for a developer, for local authorities or other statutory organisations, for NGOs or for a local group.

Overall, the aim of EcIA is to obtain the best possible outcomes for biodiversity from changes in land use. Beneficial outcomes depend on input from all stakeholder ecologists at all stages from the early design of a project through to decision-making and its implementation.

EcIA can be undertaken in a wide range of situations, for example, to provide environmental information to accompany an application for a consent (which may be incorporated in an Environmental Statement prepared as part of a Environmental Impact Assessment), to guide a devel-

opment brief or to inform a management plan. The purpose of EcIA is to provide decision-makers with relevant information about the ecological impacts associated with a project, including those that are positive as well as those that are negative.

These guidelines extend the boundaries of current EcIA practice on five key fronts:

- identifying and evaluating ecological features;
- characterising and quantifying impacts and assessing their significance;
- minimising negative impacts and maximising positive outcomes through the project design process;
- identifying legal and policy implications and their consequences for decision-making;
- identifying the role of all ecological stakeholders in achieving maximum benefits for biodiversity through the EcIA process.

2. Identifying and evaluating ecological features

The identification of ecological features and their importance is first carried out at the scoping stage of an EcIA in order to support decisions about how to focus the resources that are available for ecological survey and assessment on those impacts that are likely to be significant. A geographic zone of influence needs to be identified which contains all those ecological features that may be affected by the various biophysical changes caused by the project that is being assessed. This zone of influence will often be larger than the project site itself.

The Guidelines encourage an approach to evaluation that involves teasing apart the different values that can be attached to ecological features. The values that are identified are biodiversity value, social/community value and economic value; legal protection needs to be considered separately. Features that are important for social or economic reasons should be identified as part of assessments of the social or economic effects of a proposal. Impacts on these features should be assessed by the ecologist but the significance of the impacts should then be determined by the social or economic specialist.

It is recommended that the levels of value that are used should be based on a common geographical scale that is designed to facilitate the determination of the legal and policy consequences of significant impacts. The following geographic frame of reference is proposed for use in any EcIA: international, United Kingdom, national (i.e. England / Northern Ireland / Scotland / Wales), regional, county (or Metropolitan – e.g. in London), district (or Unitary Authority, City, or Borough), local or parish, the zone of influence (the project site or a larger area).

It is generally straightforward to evaluate designated sites against these categories, although for sites of less than district-level importance there are often no predetermined levels of value. Evaluating habitats and species can be also be difficult, although there are exceptions *e.g.* recognised ways of defining internationally/nationally important populations of waterfowl.

Sustained attempts were made during the development of the Guidelines to define how habitats and species could be assigned to different levels of value. However, such definitions proved to be unworkable in that they cannot accommodate all of the factors that should influence the definition of value, for example the size or conservation status of species populations or the quality of habitats. Furthermore, the value of a species or a habitat may change depending on whether it is being assessed in, for example, the south of England or the north of Scotland. Consequently, it is not possible to define boundaries between different categories of value for habitats or species that are applicable throughout the UK.

The Guidelines therefore propose an approach to valuing features that involves professional judgment, but makes use of available guidance and information together with advice from experts who know the locality of the project and/or the distribution and status of the species or feature under consideration.

3. Characterising and quantifying impacts and assessing their significance

The concept of significance lies at the heart of EcIA and subsequent decision-making. An EcIA carried out as part of an EIA must identify the significant impacts that a proposed development is expected to have on flora and fauna; significance assessment is also an important part of EcIAs undertaken for other purposes.

Initially information about potentially significant negative impacts is used to determine whether there is a need to refine the project proposals in order to avoid, reduce or compensate for such impacts. Confusion should be avoided between the concept of ecologically significant impacts above a given value that would make them worthy of inclusion in an EcIA and impacts that would be sufficient to trigger the formal statutory process of EIA as part of 'screening' (Troman & Fuller 2003).

Once any negative impacts have been avoided, reduced or compensated during the design process, the revised project is subject to detailed assessment. The conclusions about the significance of the impacts of the final project design are used by the authority that is responsible for determining whether to give consent to a particular project. The authority may also decide to impose planning conditions or to negotiate legal agreements in order to safeguard ecological resources.

The starting point for any EcIA is to determine which ecological features are of sufficient value that a significant impact upon them would be worthy of mention or discussion in the assessment. This should involve using the results of the evaluation (as described above for biodiversity), and applying a threshold level of value below which no reference, or only passing reference, would be made to them in the assessment. The threshold will normally be set by the level and detail of planning policy under scrutiny. Added to these should be any ecological features that have been identified as being important for social, community or economic reasons – together with legally protected species.

For all of those features above the selected threshold value it is necessary to determine whether the changes that are likely to be brought about by the development could result in a significant impact. For those impacts that are likely to be significant, it is necessary to characterise the impacts as fully as possible, making explicit reference to aspects of ecological structure and function on which the feature depends. The assessment should consider: confidence in predictions (levels of uncertainty), extent (area of an impact), magnitude (size of an impact), duration, reversibility, timing and frequency and cumulative impacts.

There are a number of approaches for determining significance in current use. Most typically, significance is defined using a matrix in which ecological value and magnitude of impact are combined to determine different levels of significance.

The term 'magnitude' in this context is in reality short-hand for the integration of a number of factors which characterise the impact, including extent (area), magnitude (size of an impact), duration and reversibility. In such matrices 'magnitude' is ranked into categories such as 'major/moderate/minor' or 'high/medium/low'. However, given that 'magnitude' in this context is an amalgam of a number of very different factors, it is difficult in practice to define these categories and their boundaries with precision. This obstructs a clear understanding of the EcIA process and, typically, results in an EcIA lacking rigour.

Using a wholly subjective link between value and 'magnitude', matrices generally assign different levels of significance to various cells in the matrix. Decision-makers using the results from such a matrix then have to distinguish between, for example, an impact of 'medium significance' against one of 'low significance' without any guidance other than an intuitive understanding of these terms, which are inevitably subject to individual interpretation.

The Guidelines promote a more transparent approach in which a positive or negative impact is determined to be significant or not, in ecological terms, in relation to the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area which relates to the level at which it has been valued (see below). The decision about whether

an impact is significant or not is independent of the value of the ecological feature (other than in the context of the threshold described above). Subsequently, the value of any feature that will be significantly affected can be used to determine the implications in terms of development control or other policies.

Using this approach, there will be some situations when an ecologist concludes that a defined site is of sufficient value that it could be significantly affected, but then, having undertaken further analysis, concludes that the integrity of the site will not be affected (i.e. there will be no significant impact on the site itself). However, this will not preclude there being habitat features or species present on the same site that are also of sufficient value that they could be significantly affected and for which the ecologist concludes that an impact will be significant in relation to their conservation status. This will trigger the policies and/or legislation that apply to features/species populations of that level of value. For example, whilst a particular impact may not be considered to have a negative impact on the integrity of an SPA, it may be considered to be significant in terms of the conservation status of the population of a species of value in a county context within the SPA that is not a qualifying species relating to the SPA classification.

It should be noted that the concepts of integrity and conservation status are not always relevant to assessments relating to legally protected species, for which the EcIA has to demonstrate why the project will not result in the law being contravened. However, for legally protected features that are also of high biodiversity value, it may be necessary to carry out an assessment of the significance of any impacts as well.

Integrity

The EC Habitats Directive (Article 6) introduces the term ‘integrity’ in considering the ecological significance of an impact with reference to European sites. Integrity is not defined in the Directive, but a definition is given in official EC guidance in relation to European sites: *‘The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified’*.

The concept of ‘integrity’ was originally applied to ecosystems but can be applied to defined sites that can reasonably be considered to represent an ecosystem. In order to understand impacts on integrity it is necessary to take account of ecosystem processes and functions. Use of the concept of ecological integrity must recognise that ecosystems are inherently dynamic and can change in both time and space and that their boundaries are not fixed but are both dynamic and permeable. It is also necessary to take an integrated approach and to look at specific impacts in the context of the overall functioning of the whole system. There may be components of an ecosystem/site that appear to have little value in themselves, when considered in isolation, but which nevertheless play an important part in maintaining or supporting the overall value of the ecosystem/site.

All ecosystems/sites have a certain ‘freeboard’ in terms of biophysical change that can be a sorbed before their fundamental ability to support characteristic habitats or species populations is compromised. Clearly there will sometimes be an element of doubt as to whether the predicted change is sufficient to cause changes to the integrity of an ecosystem/site. This should be reflected in the confidence levels attached to the prediction. In some cases, it may be appropriate to incorporate mitigation measures into the project design that are designed to increase the level of confidence in the prediction that has been made.

Conservation Status

The Habitats Directive provides definitions of ‘conservation status’ for habitats and for species [Council Directive 92/43/EEC, Article 1, sections (e) and (i)]. The IEEM guidance uses slightly modified versions of these definitions such that evaluation of conservation status can be applied to

habitats or species within any defined geographical area and will relate to the geographical scale at which the feature is considered important:

- for habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions, as well as the long-term survival of its typical species within a given geographical area;
- for species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.

When assessing potential effects on conservation status, the same reasoning should be applied as set out above in relation to integrity. The known or likely trends and variations in population size should be considered. The level of ecological resilience, in terms of the quality of physical and biotic conditions, that would permit the given population of a species or area of habitat to continue to exist at a given level, or continue to increase along an existing trend, should also be estimated.

Finally, the determination of the significance of positive or negative impacts in relation to both integrity and conservation status may be assisted by reference to the conservation objectives for any ecological feature where these are available or can be agreed.

4. Minimising negative impacts and maximising positive outcomes through the project design process

There is a growing body of opinion that new developments should deliver net ecological gain rather than simply being designed to achieve mere damage limitation. Right from the start, proponents of any project should therefore incorporate, as part of the project design and its implementation, measures that are required to deliver ecological enhancements as well as measures to:

- avoid negative impacts - especially those that could be significant;
- reduce negative impacts that cannot be avoided through the design of the project;
- compensate for any remaining significant negative impacts.

The objective should always be to agree the identified measures with the proponent of a project so that they become part of the project that is subject to detailed assessment. An EcIA is effectively meaningless if it provides an assessment of the significance of the residual impacts of a project based on the proposed mitigation measures being implemented even though these measures have not been agreed by the proponent. Similarly, a shopping list of 'proposed mitigation' at the end of an EcIA is of very little value as it requires the authority making the decision about a consent to enter into discussion with the proponent to agree what will be implemented. Such a discussion may lead to agreement over certain measures being included in the project, but these should then be subject to further assessment work to define the ecological impacts of the amended project. These changes may also have implications for other assessments that have been undertaken by other technical specialists (e.g. landscape architects and acousticians), who would then need to revisit their assessments, introducing further costs and delays to the decision-making process.

In agreeing how a project can be changed to include mitigation measures or ecological enhancements, it is important to ensure that any uncertainty associated with the implementation of ecological aspects of the project design is adequately reflected in the assessment of impacts and their significance. It is also important to identify any requirement for monitoring, for example to allow aspects of the project to be adjusted during construction and/or operation to improve positive outcomes or reduce negative impacts.

Environmental Action or Management Plans are often a very effective means of incorporating into one document all those aspects of the project that are being taken forward for ecological

or other environmental reasons, including monitoring. Such plans can be subject to enforcement through a condition attached to a consent or through a legal agreement.

5. Identifying legal and policy implications and their consequences for decision-making

The scoping stage presents the first opportunity to make explicit the legal and policy context in which the EcIA process should take place. All those involved in the overall design, planing and implementation process should be fully aware of this context. Failure by a proponent to take account of the legal and policy context, and to provide sufficient information to comply with these, may result in an application being refused.

The EcIA will have identified the significant impacts and the value of the ecological features affected by the proposal. Those making decisions in relation to a project involving an EcIA have to test whether the project (together with all of its constituent parts that have been designed to deliver environmental enhancement, mitigate negative impacts or compensate for unavoidable negative impacts):

- complies with legal requirements (e.g. a licence for any work affecting legally protected species or a Land Drainage consent);
- conforms with national and local policies;
- requires conditions to be attached to the consent or legal agreements to be negotiated.

It is important that a proponent is able to demonstrate commitment to the full implementation of the proposed mitigation, enhancement and compensation measures. Commitment can be demonstrated through the submission of designs and supporting information including a detailed explanation of what is to be done, how it will be achieved, where and when it is to be carried out, and who is responsible for ensuring that works are undertaken as proposed.

Planning conditions or legal agreements can be used to require the delivery of the proposed mitigation. The willingness of the proponent to enter into such arrangements will influence the assessment of the likelihood of success of the mitigation.

6. Identifying the role of all ecological stakeholders in achieving maximum benefits for biodiversity through the EcIA process

This guidance seeks to achieve maximum benefits for biodiversity through the EcIA process by identifying all the ecological stakeholders including those:

- advising the proponent of the project;
- advising the Local Planning Authority and other statutory organisations who are making decisions and/or consents;
- representing statutory consultees, such as country conservation agencies and environment agencies;
- representing non-governmental organisations, such as Wildlife Trusts or the RSPB, or local groups.

If the knowledge and expertise of all the relevant individuals and bodies is applied to a project with the objective of seeking to achieve the best for biodiversity, the result is likely to be better than if co-operation and information is withheld. It is important that all those involved understand both the role of other stakeholders and the possible consequences of a lack of co-operation.

7. The IEEM Guidelines

These Guidelines have been endorsed by the Association of Local Government Ecologists, the Countryside Council for Wales, English Nature, the Environment Agency, the Environment and Heritage Service, the Institute of Environmental Management and Assessment, the Scottish Environment Protection Agency, Scottish Natural Heritage and The Wildlife Trusts.

The Rural Development Service (RDS) is responsible for the Environmental Impact Assessment (Uncultivated Land and Semi-natural Areas) (England) Regulations 2001. Whilst fully endorsing the processes for Ecological Impact Assessment as set out in this document, RDS recognises that some of the recommendations may be disproportionate or inappropriate for the determination of likely significance for some smaller agricultural projects.

The Guidelines are available online on the IEEM website (www.ieem.org.uk/ecia/index.html) from which they can be downloaded as a pdf. The website will host examples of EcIA undertaken using the Guidelines.

The online format of the Guidelines will allow them to be updated at appropriate intervals to take account of changes in legislation and policies as well as developments in the science that underpins the EcIA process.

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