

## Scottish Executive Trunk Road Design and Construction Division – EclA Guidelines Comments

It has been stated recently that the processes for Appropriate Assessment and EIA, while often linked in terms of baseline data, are separate legislative processes. SNH have repeated this several times recently, as have SEERAD. These draft guidelines are, in many ways, advocating the opposite approach with the use of words like integrity and status being used. This is potentially very confusing to less experienced ecologists using the guidance, non-ecological ES coordinators/project managers and to the wider reader of Environmental Statements (particularly where information to inform Appropriate Assessment is included in the same ES and/or consent process). We would advocate that the two strands of legislation and their resulting processes, terms etc. are kept separate. It is stated in 1.11 that separate guidance will be produced for AA and there is a wealth of good information already available which consultants and competent authorities are using; again, it therefore makes sense to keep the two completely separate. However, although we still think the above overall following the presentation IEEM made it is clearer why the terms have been used, perhaps a clearer explanation of why they have been used is required to emphasise the separation between these legislative processes.

### Determining Value (p19 ---)

This section is a thorough explanation of all the things to consider when determining value and is very useful as outline guidance to follow. As acknowledged, it does not actually arrive at a single practical approach and we agree that it should not. Most ecologists develop their own specific approach to this which is often summarised in a table format and this normally works at present, especially when backed up by additional text which includes a note on the need for professional judgement. We feel that experience is key to this process and only senior/principal level ecologists should be undertaking ecological valuation for EIAs. Although professional judgement is in a way promoting an element of subjectivity we feel that it is still key to allow for it since this is additional guidance and does not do away with this need totally.

### Impact Assessment (p28 ----)

P28 – the word “compensation” should not be used in EIA because it becomes very confusing if appropriate assessment is also involved in the same proposal. Also, there is case law to say that mitigation and compensation are mutually exclusive under the Habs. Directive i.e. the terms cannot both be used interchangeably. This case law is specific to the Habs. Regs., however, it perhaps introduces an additional confusing element for ecologists dealing with both legislative threads.

P31 – goes some way toward providing guidance for cumulative and in-combination assessment but could do with being more detailed. We would like to see an update of the DMRB addressing these issues in a lot more detail than that presented here, however, there is a useful opportunity to explore it further here. The Scottish Executive has used some of the general guidance from the EC but we have also learnt a lot from the Canadian approach to cumulative/in-combination assessment.

P32 – 4.4.1.4 – ACKNOWLEDGE THAT THERE ARE LIMITATIONS WITH CURRENT MATRICES, HOWEVER, EXPERIENCE GOES A LONG WAY TO MAKING THEM WORK WITH AN ELEMENT OF PROFESSIONAL JUDGEMENT. FOR TRUNK ROADS WORK, IN PARTICULAR, WE WOULD STILL LIKE TO USE THE MATRIX APPROACH HOWEVER, WE ACKNOWLEDGE THAT IT IS CRITICAL TO MAKE CLEAR WHETHER AN IMPACT IS SIGNIFICANT OR NOT.

P33 – Integrity – the use of the word integrity is difficult since we have reservations on its applicability to linear infrastructure corridors/schemes that can cut across many features. Obviously fragmentation is a key issue in such schemes and does form part of all assessments but integrity as a concept works best for coherent sites and mainly those that have been designated since their boundaries have often been chosen to accord with the integrity of the whole site, on designation and accordingly a set of meaningful conservation objectives can be easily and usefully matched to them.

P34 - conservation status – this is fully relevant to EIA and is already used by good ecologists, although not necessarily with that precise terminology, when they are undertaking assessment. Again, it is critical that the use of this term is linked clearly to EIA since it could be confusing for less experienced ecologists in understanding the differences between EIA and AA.

We recognise that overall this guidance is a big step in the right direction for the ecological aspects of environmental assessment. However, we have a concern that this guidance may separate ecological impact assessment from the general process followed by other environmental topics. Our concern on this is related to the fact that EIA/ES's must be able to be understood by a reasonably intelligent member of the public. With the current approach it is fairly straightforward for a person to follow the methodology between different topics, even although there may be parts of the specific methodology which are subject specific. Further, the matrix approach for most subject areas allows this continuity to occur. This guidance may make ecology Chapters more complex to follow and in danger of being "elitist". To prevent this from occurring it is critical that the guidance emphasises that the ecology chapter of an EIA is really a summary of the significant issues and all background and other technical details are contained in appendices.

The guidance does not really address the need to keep sensitive information confidential (e.g. Schedule 1 birds). Considering FoI rules now – it would be really useful for this to be addressed. Third party information is particularly difficult in this regard.

SPECIFIC COMMENTS – IN TEXT.

## SUMMARY

These Guidelines have been developed by the Institute of Ecology and Environmental Management (IEEM) to promote good practice in Ecological Impact Assessment (EclA).

EclA 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)<sup>1</sup>. EclA may be carried out as part of a formal environmental impact assessment (EIA) or to support other forms of environmental assessment or appraisal. EclA should include the following stages:

**scoping**, involving consultation to ensure the widest possible input to all following stages (in practice this is iterative throughout the EclA process);

identification of the likely **zone of influence** arising from the proposals;

identification and evaluation of ecological resources and features likely to be affected;

identification of the **biophysical changes** likely to affect **valued ecological resources and features**;

assessment of whether these biophysical changes will give rise to a significant ecological impact, defined as an impact on the **integrity of the defined site or ecosystem(s)** and/or the **conservation status of habitats or species**, including cumulative impacts;

refinement of proposals to incorporate **ecological enhancement** measures and to avoid, reduce or compensate for any significant adverse impacts;

provision of advice on the **consequences for decision making** of the significant ecological impacts, based on the value of the affected resource or feature; and

provision for **monitoring** and following up the implementation and success of mitigation measures and **ecological outcomes**.

The EclA process should be iterative and able to respond to increasing knowledge of a proposal and its impacts. It is also a 'partnership' process, most effective if all ecologists involved work in collaboration.

# 1. INTRODUCTION

## Background

- 1.1 IEEM wishes to improve outcomes for biodiversity by promoting a more scientifically rigorous and transparent approach to Ecological Impact Assessment (hereafter referred to as EcIA). 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)<sup>i</sup>. A common framework for EcIA will help promote better communication and closer cooperation between all ecologists involved in the process.
- 1.2 EcIA is a key component of Environmental Impact Assessments (EIA) carried out to meet the requirements of the EC Council Directive 85/337/EEC on the Assessment of the effects of certain public and private projects on the environment<sup>ii</sup>, as amended by Council Directive 97/11/EC<sup>iii</sup>. The statutory instruments that implement these directives in England, Scotland, Wales and Northern Ireland can be found on the web site of the ODPM<sup>iv</sup>. Henceforth, these are referred to throughout this document as the UK EIA Regulations. As most EIAs are carried out to inform planning decisions the emphasis of these guidelines is in relation to planning.
- 1.3 Ecological evaluation and assessment may also be undertaken voluntarily to investigate the effects of a proposal, or required to fulfil the requirements of other legislation, regulations and policy; this information is also available on the web site of the ODPM. Changes in legislation and policies generating a requirement for EcIA, as well as developments in the science which underpin the assessment process, may necessitate periodic review and revision of these guidelines.

## The Purpose and Context of the Guidelines

- 1.4 The purpose of EcIA is to provide decision-makers with information about the likely significant ecological effects associated with a proposal. Good outcomes for biodiversity depend on input from ecologists at all stages in the decision-making and planning process, from the early design of a proposal through to its implementation.
- 1.5 These guidelines provide practical advice for ecologists involved in EcIA for any type of terrestrial proposal in the UK. They are intended for everyone involved in the process, whether they are acting as ecologists for:
  - the proponent e.g. the developer (required to provide necessary information);
  - a competent authority (charged with making the final decision);
  - consultees (who may advise the competent authority in a statutory or voluntary capacity); or
  - the public.

Where possible, issues of particular relevance to different roles have been identified.

- 1.6 These guidelines rely on ecologists using their professional judgement throughout the EcIA process. Judgements should be made on the basis of an honest assessment of the best information available. Good communication between the ecologists and other professionals involved in the assessment process, together with proponents and relevant specialists will reduce the risk associated with making such judgements. Where limitations are identified, these should be clearly stated and their implications considered. Limitations may include:
  - data;
  - time;
  - season;
  - scientific understanding of ecological processes;
  - experience of the assessor;
  - information about the proposal;
  - experimental mitigation strategies;
  - commitment to delivery of mitigation strategies; and
  - enforcement of mitigation strategies.

- 1.7 There will be constraints to any EclA and where there is reasonable doubt, a precautionary approach should be taken.

## **Terminology**

- 1.8 Consistent use of terminology is important to avoid ambiguity in assessment of impacts. A glossary of terms has been included to indicate how terminology has been used for the purposes of these guidelines.

## **Relationship with other guidance**

- 1.9 These guidelines have been developed using an inclusive approach and set out widely accepted good practice for each stage in the EclA process; they are not legally binding and other approaches will be valid and appropriate in some situations.
- 1.10 These guidelines have been developed to expand upon existing guidance summarised in Box 1. More detail is also given in Appendix 1 of the relationships between this guidance and Transport Assessment Guidance (Department for Transport<sup>v</sup>).
- 1.11 IEEM intends to produce separate advice on assessments required in the following circumstances:
- where an Appropriate Assessment is required to meet the provisions of EC Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora<sup>vi</sup>;
  - where a Strategic Environmental Assessment (SEA) is required to meet the provisions of EC Council Directive 2001/42/EEC on the Assessment of the effects of certain plans and programmes on the environment<sup>vii</sup>; and
  - within the marine environment.
- 1.12 This document provides no guidance on determining whether geological and hydrological impacts ('soil conditions') are significant. However, consideration of impacts arising from hydrological or hydro-geological changes should be part of EclA and these are discussed in Chapter 4.

## **The Aims of the Ecological Assessment Process**

- 1.13 Those involved in EclA should be seeking to obtain the best possible biodiversity outcomes from land use changes. It is important that all interested parties can understand the process by which the assessment has been made, and how and by whom any actions needed to deliver biodiversity objectives will be achieved and monitored. Therefore, the EclA must provide reliable information and interpretation of the ecological implications of any proposal.

### Box 1: Existing guidance on EIA and ecological/biodiversity

Transport Assessment Guidance (TAG), December 2004 (Department for Transport)  
www.webtag.org.uk<sup>viii</sup>

Institute of Environmental Assessment and Management (2004). Guidelines for Environmental Impact Assessment. IEMA, Lincoln.<sup>ix</sup>

Note On Environmental Impact Assessment Directive For Local Planning Authorities (1999 EIA Regulations) (ODPM, 1 July 2002).<sup>x</sup>

The Essex Guide to Environmental Impact Assessment (Essex Planning Officers' Association, October 2002).<sup>xi</sup>

Environmental Impact Assessment (EIA): A handbook for scoping projects (Environment Agency, May 2002).<sup>xii</sup>

A Handbook on Environmental Impact Assessment, Scottish Natural Heritage (January 2002).<sup>xiii</sup>

Developing Naturally. (2001). A handbook for incorporating the natural environment into planning and development. Mike Oxford. Association of Local Government Ecologists.<sup>xiv</sup>

Environmental Assessment - A Guide to the procedures (DETR and National Assembly for Wales, November 2000).<sup>xv</sup>

Methodology for Multi-Modal Studies (GOMMMS) Vols. 1 & 2<sup>xvi</sup> (DETR, March 2000) (section 4.10) and GOMMMS Supplement 1 Accumulating Environmental Impacts (February 2002).<sup>xvii</sup>

Biodiversity Impact – biodiversity and environmental impact assessment: a good practice guide for road schemes (Byron, 2000<sup>xviii</sup>) & summary leaflet Biodiversity Impact – biodiversity and environmental impact assessment: a new approach (RSPB et al).<sup>xix</sup>

DETR Circular 02/99 Environmental Impact Assessment.<sup>xx</sup>

Guidelines for Baseline ecological assessment (IEA, 1995).<sup>xxi</sup>

Nature conservation in Environmental Assessment (English Nature, 1994).<sup>xxii</sup>

Design Manual for Roads & Bridges Volume 11 Environmental Assessment (DoT, Scottish Office, Welsh Office & DoE Northern Ireland, 1993) (Section 3, Part 4).<sup>xxiii</sup>

1.14 It is the role of all ecologists involved in ecological assessment to:

- provide an objective and transparent assessment of the ecological effects of proposals to all interested parties, including the general public;
- facilitate objective and transparent determination of the consequences of the proposal in terms of national, regional and local policies relevant to nature conservation and biodiversity; and
- set out what steps will be taken to ensure that legal requirements relating to habitats and protected or controlled species are met.

1.15 To optimise outcomes of planning decisions for biodiversity the Royal Town Planning Institute has recommended that the following principles should be pursued<sup>xxiv</sup>:

Information:	Obtain sufficient information on the environmental resources and natural processes to assess the significance and impact of the proposal.
Avoidance:	Consider options that avoid harm to environmental resources or natural processes.
Reduction:	Where adverse effects are unavoidable then these should be mitigated either through the design of the proposal or through measures that can be subsequently guaranteed – for example, through a condition or planning obligation.
Compensation:	Where, despite the mitigation proposed, there are significant residual adverse environmental effects these must be offset by appropriate compensatory measures nearby/elsewhere.
New Benefits:	Seek to provide net benefits for biodiversity over and above requirements for mitigation or compensation.

These principles are also relevant to projects outside the formal Town and Country Planning sector, i.e. to consents under other EIA regulations.

- 1.16 These principles should be applied throughout the land use planning process, from strategic land use allocations to decisions regarding individual proposals.

## Contents of the guidance

- 1.17 EclA is an independent, stand-alone process and may be carried out for a range of decision-making purposes, in addition to EIA. EIA provides a logical framework into which most EclAs fit and this guidance is structured round the main stages in the EIA process (see Box 2). Although set out in stages, EclA is an iterative process, most successful where there is effective communication and information sharing.
- 1.18 Chapter 2 addresses ecological considerations that should be taken into account when determining whether or not EIA is required (**'screening'**). It also provides detailed information about **'scoping'** (which applies both to formal EIAs and informal ecological assessments) to determine the coverage of environmental information to be submitted to the competent authority and the proposed methods to be used.
- 1.19 It is rarely possible to study all possible ecological impacts to the same level of detail. Effort must be focused on those features or resources sufficiently important or valuable to merit more detailed surveys or searches. It is important that a clear rationale is given for decisions about ecological value or importance so that all those involved in the assessment can understand the reasoning behind the scope of investigations. Policy and legal considerations (see ODPM web site) influence the criteria that will be appropriate for determining importance in any particular case. It may also be necessary to revisit decisions about the value of features and/or scope of work, once the results of preliminary investigations are available.
- 1.20 Ecological **'valuation'** to determine the importance of ecological features and resources is an essential part of the EclA process and is described in Chapter 3. It is first carried out at the scoping stage to support decisions about how to invest limited resources in ecological survey and assessment. Later, the value of a feature is used to determine the legal, policy and development control consequences of a significant impact.
- 1.21 The concept of significance lies at the heart of EclA and subsequent decision-making. This subject is discussed further in Chapter 4. An ecological assessment must include a description of the ecologically significant impacts of a proposal and of how likely they are to occur. This, together with the value of the affected resource or feature, should then be given due consideration; firstly when identifying the need for mitigation and secondly, in determining whether to give consent to a particular proposal, or deciding what planning conditions or legal obligations are appropriate to safeguard ecological interests, if there are likely to be significant residual impacts (after mitigation).
- 1.22 The criteria and standards used for **determining whether ecological impacts are significant** vary and decisions are often necessarily subjective. This guidance suggests a systematic and consistent approach to determining whether an ecological impact is significant that should help to reduce the need for subjective

judgement. In this guidance a significant impact, in ecological terms, is defined as an impact (adverse or positive) on the integrity of a defined site or ecosystem(s) and/or the **conservation status of habitats or species within a given geographical area**, including cumulative impacts. This assessment may be assisted by reference to conservation objectives where available.

- 1.23 Chapter 5 provides further advice on mitigation to ensure that acceptable levels of ecological value can be maintained following implementation. It is important to ensure that any significant residual impacts are clearly identified by taking mitigation into account.
- 1.24 Chapter 6 sets out the consequences of a significant impact, in terms of the legal and policy framework within which a decision should be taken by a competent authority.
- 1.25 Throughout this guidance a series of worked examples based on the Dartford warbler has been provided for illustration.

## Box 2: EclA Process

### Proposal design

- Obtain information on proposal, its alternatives and existing ecological information.
- Review ecological implications of alternatives.
- Discuss design with client and engineers and outline key ecological considerations.
- Seek opportunities for ecological enhancements as early as possible, as well as opportunities to modify design to avoid or reduce adverse ecological impacts.

### Screening (EIA only)

The proponent may seek a formal screening opinion from the competent authority concerning the need for formal EIA under the Regulations. For Schedule 1 projects EIA is mandatory. For Schedule 2 projects the need for EIA is determined based on the significance of anticipated environmental effects as influenced by *inter alia* the nature, size and location of the proposal. Ecologists may need to determine whether significant ecological impacts are likely.

### Scoping

Scoping should:

- Identify and establish contact within the EclA team.
- Identify all proposed activities that may generate ecological impacts.
- Propose suitable spatial and temporal scopes for the assessment and identify the main ecological issues to be addressed.
- Undertake preliminary assessment of potential ecological receptors and impacts.
- Reconsider spatial and temporal scope. Amend extent of preliminary investigations if necessary.
- Identify potentially important ecological features that are likely to suffer significant impacts and therefore require detailed assessment.
- Suggest suitable survey/research methodologies and agree these with consultees.
- Produce scoping report/summary and circulate for comments.
- Modify scoping report/summary in light of comments. Confirm potential opportunities for ecological enhancement or avoidance of impacts.

In relation to EIA, the proponent may seek a formal scoping opinion from the competent authority to clarify scope and content.

### Impact Assessment

Ideally, the whole EclA team will be involved in the following assessment process. The surveys and research needed to provide this information may also indicate that the scope of the assessment should be adjusted.

- Determine value of ecological features and resources affected through survey and/or research.
- Assess impacts affecting important features and resources, with reference to ecological processes and functions as appropriate.
- Quantify amount and proportion of resources affected.
- Assess impact reversibility/recoverability of resources affected.
- Obtain information on impact parameters and confidence limits.
- Identify significant impacts in the absence of any mitigation.
- Review the temporal and spatial scope of the assessment and undertake further studies as required.

### Evolution of Proposal Design and Mitigation

- Identify measures to avoid or reduce adverse impacts.
- Where impacts cannot be avoided/reduced identify compensation measures to be implemented.
- Identify opportunities for enhancement.

- Demonstrate likely success of mitigation measures.
- Provide sufficient information for mitigation measures to be implemented effectively, e.g. with an Environmental Action Plan (EAP<sup>1</sup>).

### **Identify significant residual impacts and their legal, policy and development control consequences**

- Produce a clear summary of the significant residual impacts of the proposal incorporating all mitigation and enhancement measures.
- Consider consequences of significant residual impacts in the light of planning policies and legislation.
- Propose and evaluate compensation, as required.
- Include compensatory actions in EAP or similar.

### **Reporting**

The final report or Environmental Statement (ES) should include all the environmental information necessary for a decision to be made, including ecological information. Key aspects include:

- Clear description of ecological baseline and ecological status if the proposal does not go ahead.
- Clear explanation of the criteria used to evaluate ecological resources and assess the significance of impacts.
- Clear identification of likely ecological impacts and an explanation of their significance.
- Description of legal and policy consequences.

### **Follow-up and monitoring**

- Implementation of conditions/planning agreements.
- Design and agree monitoring strategy with consultees.
- Audit predicted impacts against actual situation.
- Take measures to rectify unexpected impacts/ineffective mitigation measures.

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<sup>1</sup> In these guidelines EAP has been used to denote Environmental Management Plans and Environmental Design Management systems.

## 2. SCREENING AND SCOPING

### Screening

- 2.1 Screening is the determination of whether or not a formal assessment is required for a proposal. Under the EC EIA Directive, EIA is a mandatory requirement for types of proposals listed in Annex 1. It is also required for types of projects that meet the criteria for Annex 2 development and are likely to have significant environmental effects (e.g. as defined using the criteria in Schedule 3 of the UK EIA Regulations).
- 2.2 For proposals of types included in Annex 2 it is necessary to determine whether or not a proposal is likely to have a significant effect on, for example, a Site of Special Scientific Interest (SSSI), Area of Special Scientific Interest (ASSI), Special Protection Area (SPA), Special Area of Conservation (SAC) or Wetland of International Importance (Ramsar site). A proponent may seek a formal screening opinion from the competent authority concerning the need for a full EIA or may decide to carry out an EIA in any case. The determination of whether or not there will be a significant effect such as to trigger the need for an EIA should follow the approach described in these guidelines, particularly in Chapter 5. It is likely that the screening decision will be taken using existing data only.
- 2.3 Where an EIA is not required, there is no statutory provision for a proponent to ask the competent authority whether an EIA should be prepared. However, it is in the best interests of all, including biodiversity, if the possible requirement for an EIA is considered at an early stage.

### Scoping

- 2.4 'Scoping is the process of determining the content and extent of matters that should be covered in the environmental information to be submitted to a competent authority or other decision making body'<sup>xxv</sup>.
- 2.5 The process of scoping is essential to all EIAs; preparation of a scoping report is widely accepted good practice. It helps to clarify key issues and promote dialogue with consultees and other stakeholders concerning key ecological issues and proposed methodologies for survey and evaluation.
- 2.6 Key benefits of scoping include:
- early stakeholder input, so issues of concern are identified and dealt with at an early stage;
  - an assessment focussed on key (significant) impacts (Circular 02/99 Environmental Impact Assessment states that "In many cases, only a few of the effects will be significant and will need to be discussed in the Environmental Statement (ES) in any depth. Other impacts may be of little or no significance for the particular proposal in question and will need only very brief treatment to indicate that their possible relevance has been considered"<sup>xxvi</sup>);
  - clear terms of reference for all ecologists involved in the assessment, including an understanding of the criteria that will be used to evaluate the significance of their findings; and
  - early identification of the need for seasonally dependent surveys so that they can be accommodated in scheduling.
- 2.7 Trends in national, regional and local policies are also leading to a requirement for projects to achieve biodiversity benefits, not simply to avoid adverse impacts. The scoping process provides an opportunity for ecological professionals to work together to

achieve these objectives and lays the foundations for the whole consultation and assessment process.

- 2.8 The results of scoping may be presented as a formal report or letter. It is good practice to produce such a document for any proposal requiring detailed ecological survey, particularly where stakeholder-input is essential in defining terms of reference acceptable to all parties. A scoping report enables statutory and other consultees to see how their requirements and concerns will be addressed and gives them an opportunity for constructive input. A scoping report is generally used as the basis for applying for a formal scoping opinion (see paragraph. 2.9 below).

### **Statutory position and responsibilities**

- 2.9 There is no legal requirement for scoping, even in EIA; proponents are though entitled to seek a formal 'scoping opinion' from the competent authority under the UK EIA Regulations 1999. The 'scoping opinion' summarises the specific advice of the relevant authority concerning the required coverage and content of the Environmental Statement (ES) for a particular application. The 'scoping opinion' is not binding and further input may be requested when more information is available.
- 2.10 In the absence of a formal 'scoping opinion' (e.g. if a voluntary EclA is undertaken), it will usually fall to the proponent's ecologist to advise the proponent on the scope of ecological information and investigations likely to be required.
- 2.11 Statutory consultees for the EIA process can play an important role in scoping, providing contextual information and advice on any legal/statutory requirements and good practice.

### **The scoping process**

#### ***Overview***

- 2.12 Scoping should be seen as a flexible, adaptive and iterative process, usually based on preliminary consultations, literature searches, site-visits and preliminary ecological surveys.
- 2.13 Scoping may be considered more effective when results are already available from preliminary ecological surveys, or it may be seen as a mechanism for stakeholders to guide the design and implementation of such surveys. There is no set formula, but it should include the elements identified in Box 3. If scoping commences at an early stage in the assessment, it may be necessary to 'mark forward' some of these elements, until adequate information has become available. More information on each of the stages described in Box 3 is provided in subsequent sections.

### Box 3: Stages in Scoping

1. Obtain information about the proposal from the proponent or their engineers/designers (paragraphs 2.4-2.6 and Box 5).
2. Identify proposal activities likely to cause ecological damage, stress or disturbance. Clarify their spatial extent, timing, frequency and duration (Box 6).
3. At the same time, identify opportunities for enhancing biodiversity and delivering biodiversity objectives.
4. Identify stakeholders, consultees and all ecologists involved and establish a consultation strategy (paragraphs 2.17-2.18).
5. Identify relevant legislation, regulations and policies and review their requirements (paragraphs 2.22-2.23).
6. Identify the ecological resources affected by the proposal. Develop an understanding of the ecological context based on existing ecological information, data gathering, literature searches, site visits and any baseline studies already carried out. Identify the factors affecting the integrity of important ecosystems and the conservation status of important habitats and species (paragraph 2.24).
7. Consider potential sources of cumulative effects.
8. Select ecological resources or issues likely to be significantly affected and therefore requiring further study and explain the criteria used.
9. Clarify information requirements. Agree details of proposed survey/research methodologies. Confirm the study area and the criteria that will be used to assess its nature conservation value.
10. Consider potential mitigation/enhancement opportunities.
11. Produce scoping report as a basis for further consultation with the competent authority, statutory consultees and others involved in the assessment process.
12. Refine the scope of the assessment based on feedback on the scoping report - the revised scope provides the terms of reference for the remainder of the ecological assessment.
13. Continue to refine the scope of the assessment during the rest of the assessment - scoping out potential impacts that are no longer considered likely to be significant and addressing newly identified impacts that are likely to be significant.
14. Consult as widely and early as possible throughout.

### **Information about the proposal**

- 2.14 The first step is to review proposed activities and identify those likely to cause ecological impacts or deliver biodiversity enhancements: what are the proposed activities, where and when will they take place? How long will they last? Activities may differ throughout the lifetime of a project, so identify activities associated with construction, operation (best and worst-case operating conditions) and decommissioning as appropriate. If possible, map the location of infrastructure and the distribution of activities. Identify areas and resources that may be affected, however remote from the proposal site. This enables identification of the **zone of influence** (see Box 4).

Box 4: Example illustrating factors to consider when defining the zone of influence of a proposed quarry

- All ecological features or resources occurring on the site itself will be affected by changes in land cover caused by topsoil stripping and excavation.
- Noise, dust and changes in human activity will also affect species in adjacent habitats.
- If the quarry involves major, long-term dewatering operations, there could be consequences for water-dependent habitats that are many miles from the quarry. It may not be possible to determine the zone of influence of dewatering without understanding groundwater and hydrology. The zone of influence should include all water-dependent receptors that could be significantly affected by the predicted draw-down, providing they are of sufficient value to be considered in the assessment.
- If the quarry will require new infrastructure (roads, power supply or waste water disposal) there could be significant consequences for ecological features beyond the boundaries of the site. The zone of influence should include all such features which are of sufficient value to be included in the assessment.
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2.15 In many cases it is difficult to establish the full extent of changes caused by a proposal, in which case it is better to err on the side of caution to ensure that the study area incorporates areas of impact and 'no impact'.

2.16 The information likely to be required about a proposal is summarised in Box 5. Examples of activities that may generate ecological impacts are given in Box 6.

**Box 5: Information about the proposal (see Relevant Schedule to UK EIA Regulations)**

A wide variety of information is required to carry out EIA effectively:

- location, size, extent and spatial organisation of infrastructure and activities;
- lifetime of proposal including decommissioning; timing and duration of activities likely to cause ecological impacts during construction, operation and decommissioning;
- activities likely to cause ecological impacts, their timing, duration, location, extent and magnitude, e.g. emissions (type, volume, range), construction activities, etc. (See Box 6);
- activities designed to deliver biodiversity enhancements;
- 'impact zones' or 'effect areas' for main activities;
- receiving environment or 'pathway' for emissions (e.g. water, soil or air); and
- best and worst case operating conditions.

To take widespread or cumulative effects into account, information on the context may be required, including:

- in-combination proposals (already implemented, currently proposed and that can reasonably be expected in future);
- associated/connected proposals; and
- similar proposals in the region/other development types affecting similar resources.

To assess the impacts of alternatives the following information will be needed:

- alternative sites; and
- alternative designs.

## Box 6: Activities likely to generate impacts

### **Construction Phase:**

- Temporary offices, compounds and access roads/tracks.
- Demolition operations.
- Blasting, e.g. for minerals operations.
- Temporary storage areas for construction materials.
- Temporary access routes for construction vehicles - both on and offsite.
- Vegetation clearance.
- Need for use of materials on site (e.g. borrowpits)
- Top soil and sub-soil removal.
- Ground and excavation works, including grouting.
- Routing of services and utilities (e.g. underground power lines, water supply and drainage).
- Assembly areas for components of construction.
- Structural works for building and engineering.
- Construction of structures and hard surfaces.
- Environmental incidents and accidents (e.g. spillages, noise and emissions).
- Removal of site offices/compounds and final site clear away after construction.
- Lighting.
- Fires.
- Access and travel on- and off-site.

### **Occupation/Operational Phase**

- Access (both route and means).
- Implementation of landscape design and habitat management (type and location).
- Site operation and management (e.g. maintenance operations).
- Presence of people and typical uses and activities (including factors likely to cause disturbance, e.g. increased public access and pressure, lighting, noise, regular emissions).
- Presence of pets.
- Drainage.

### **Decommissioning Phase**

- Removal or demolition of disused structures that may have been colonised by, e.g. roosting bats, barn owls, other breeding birds.
- Residual pollution or contamination of soil or groundwater, e.g. extant waste dumps, abandoned tailings dams.
- Efforts to remove contaminated water or soil may mobilise pollution.

**Restoration Phase** (where operations/phases have finished, e.g. for mineral extractions).

**Potential Non-standard Operations** (e.g. one-off incidents and accidents).

(Based on Oxford 2001)

### ***Stakeholders, consultees and key players***

- 2.17 At an early stage, the competent authority and the proponent's ecologist must review the requirements for ecological input and specialist skills. This should include anyone who will contribute to the design and interpretation of the assessment process and finally advise the decision maker on the ecological consequences of their proposal, as well as any data holders.
- 2.18 Statutory and non-statutory ecological consultees play an important role by providing contextual information and local expertise. The timing of consultations will depend on the circumstances; in many cases it is helpful to engage in discussions after preliminary investigations have been completed. This will allow discussion about scope and

methods of further investigations and the proposed approach to assessment of impacts. Involvement of the public is good practice in situations where significant impacts are likely on wildlife resources and landscapes known to provide benefits to local communities.

- 2.19 It is sometimes helpful to summarise preliminary findings in a consultation document (scoping report) and to circulate this for discussion amongst consultees (see paragraph 2.41). Scoping workshops may be considered, to provide all major stakeholders with an opportunity to discuss a proposal and reach consensus on the scope of the assessment. This can significantly reduce consultation time and avoid delays caused by survey work being required at a later stage.
- 2.20 There should be some preliminary discussions about potential strategies to provide biodiversity benefits and avoid, minimise or compensate for, any adverse impacts. This will enable the preparation of such strategies to concentrate on those approaches most likely to meet approval.
- 2.21 Possible approaches to cumulative impact assessment are identified in Chapter 4. The detailed approach to be taken should be agreed between all parties concerned during scoping.

#### ***Legislation and policy requirements***

- 2.22 Establishing the legal and policy context within which the acceptability of the proposal will be considered helps to confirm the required scope of investigations. The ODPM web site identifies the possible statutes, regulations and policies. This is also considered in more detail in Chapter 6.
- 2.23 It is important to consider relevant legislation, regulations and policies at an early stage, as they may have a bearing on how impacts should be interpreted, or provide criteria that need to be used.

#### ***Ecological resources affected – establishing the baseline***

- 2.24 Having identified the zone of influence (paragraph 2.14) the valued and sensitive ecological resources within this zone should be identified. It is important to remember that the extent of this zone may need to be refined as more detailed information (both relating to the project activities and the ecological resources) is obtained.
- 2.25 Direct effects on part of a habitat or population/assemblage may have implications for the whole habitat or population and the study limits should be adjusted accordingly. Species have different vulnerability distances and periods, so the spatial scope of studies must vary accordingly.
- 2.26 For example, if the zone of influence impinged on the breeding territory of Dartford warblers, it would be necessary to understand the implications of localised impacts in relation to the distribution of the birds. If they were frequently occurring in the area, then it might be appropriate to restrict the study to the actual group of birds affected. If the birds were at the edge of their range, or the group affected were an important link in the distribution pattern, then it might be necessary to consider implications for the regional, or even the national population.
- 2.27 Consideration needs to be given to what constitutes the baseline, as it may not be the same as the conditions at the time of the assessment. In order to determine this, it is necessary to try to predict any changes that will alter conditions prior to the start of the

proposed construction and subsequent to it (see Box 7). There is no clear distinction between establishing the baseline in this situation and considering cumulative impacts. This should be determined through discussion between the players in the EclA process.

- 2.28 Additionally, it may be appropriate to consider the variation in a population over time, rather than take a single year's data as an accurate reflection of the situation.

Box 7: Example illustrating setting the baseline

A power station drawing cooling water from a river is to close down, due to a rationalisation of the power supply network. During the century in which the power station has been in use, the riverine invertebrate, fish and bird assemblages in the immediate vicinity of the power station have adapted to reflect local increased temperatures caused by the regular discharge of heated river water. Closure of the power station will mean that this discharge will stop.

Once closed, it is proposed to convert the power station building to residential units. For reasons of timing, the EclA for the residential proposal must be undertaken prior to closing down the power station.

In this instance, the baseline for the EclA of the conversion to residential use is the predicted post-closure situation, rather than that evident at the time of undertaking the EclA. The surveys and investigations to describe the baseline must be designed to enable the likely post-closure situation to be predicted as accurately as possible.

- 2.29 The results of professionally accredited or published scientific studies should be used, where possible, to establish the likely spatial and temporal limits of ecological impacts for specific activities and to justify decisions made at the scoping stage. For example, the Somerset 'Econet' project<sup>xxvii</sup> has defined 'effect distances' for use in EclA based on published literature about home ranges and vulnerability to different activities (e.g. for disturbance to breeding birds caused by road traffic<sup>xxviii</sup>).
- 2.30 Study boundaries should be drawn to include any areas that are affected both directly and indirectly. See Box 5 for examples of possible effects. An example is one for major roads; the zone of direct disturbance could extend up to 1 km on either side of the carriageway. If indirect effects are also taken into account (e.g. the effects of displaced individuals on the occupancy of alternative habitat), then the 'effect zone' could be considerably larger. Careful consideration should be given to including an adequate area within the scope to allow a rigorous assessment to be undertaken. See Box 8 for a summary of the information required to establish the spatial scope of baseline studies. A zone of influence might be much greater than the width of the study corridor that has been selected by the scheme developer. For example, for roads sometimes those organising the EIA will suggest looking at a 500m corridor, but the ecologist may need to look much wider than this.
- 2.31 Contextual information is essential to confirm spatial and temporal scope. Such information may be available from the ecological consultees and in local and national Biodiversity Action Plans or, in England, Natural Area Profiles. (See Box 9 for more details.) Adequate time and resources should be allowed to undertake such vital contextual research. These references will also provide information required in order to evaluate the relative importance of ecological receptors in their local, regional, national or international context. For example, to comment on the importance of the loss of 5 ha of secondary woodland, with confidence, it would be necessary to know the current extent of such woodland in a parish or county as well as recent trends in its status (stable or declining).

2.32 A habitat survey of the zone of influence should be undertaken. The survey should use established methodologies such as extended Phase 1 or Integrated Habitat System<sup>xxix</sup>. The

Box 8: Information required to establish baseline conditions for ecological resources within the zone of influence

**Designated sites**

- Are there any sites designated for nature conservation that fall within the zone of influence?
- Does the proposal affect any sites likely to be designated in the foreseeable future?
- Are there any legally protected breeding sites, habitats or resting places for internationally, nationally or other important species?
- Is there any policy presumption in favour of habitat creation/restoration in the area?

**General ecological considerations**

- What ecological features, components or processes occur within the area of influence? (Distributions of habitats, species and physical factors, ecological linkages and relationships, locations of key features)?
- What are their distribution and status elsewhere for comparison?
- What were their historical distributions, status and management compared with the present?
- What are their scales of variation, vulnerability and likely exposure to the proposal?
- What are the key ecological processes or species activity periods; are there seasonal variations in distribution, abundance and activity?
- Are there any species, the disappearance of which would have significant consequences for others?
- Are there any other proposals planned within the same area or time-frame that may contribute to 'in combination' effects?

habitat survey will identify the main plant communities and habitat types that may be affected by the proposal and provides a documented basis for determining the scope of more detailed surveys.

2.33 If it is not feasible within the context of a given proposal to gain access to land beyond the proposal site, it should be possible to undertake a simple Phase 1 survey from public highways or other accessible public spaces in the zone of influence. The limitations of these surveys should be described and their effect on confidence in the conclusions assessed.

Box 9: Sources of contextual information

- English Nature's Natural Area Profiles (available on CD Rom, published by English Nature in 1998. See: [www.english-nature.org.uk/templates/naturalareas](http://www.english-nature.org.uk/templates/naturalareas)).<sup>xxx</sup>
- Local Biodiversity Action Plan (Available locally or see [www.ukbap.org.uk](http://www.ukbap.org.uk)).<sup>xxxi</sup>
- For specific locations, it is usually possible to obtain information from local biological records centres, such as Wildlife Trusts and other local naturalist's societies, e.g. badger, bat, amphibian and reptile groups, but bear in mind the limited resources available to some data providers (especially small voluntary organisations).
- Scottish Natural Heritage's 'Natural Heritage Zones'<sup>xxxii</sup>.
- Urban Nature Conservation Strategies.<sup>xxxiii</sup>
- Land Cover Map 2000 (LCM2000) (Centre for Ecology and Hydrology).<sup>xxxiv</sup>

2.34 For assessments with a wide geographic coverage (for proposed roads or pipelines, for example), it may be worth buying aerial photographs or satellite images or even commissioning new ones. These can provide insight into spatial relationships, so that

the impact assessment can be designed to 'capture' ecological distributions, processes and interactions at an appropriate scale.

### **Selecting ecological resources and issues requiring detailed assessment**

- 2.35 As it is impossible to investigate all issues in detail, it is necessary to focus further study on those most likely to generate significant ecological impacts (adverse or positive). This is consistent with the UK EIA Regulations, which only require investigation of likely significant effects. The rationale and criteria used to select certain aspects for more detailed study (and others excluded from further investigation) should be agreed during scoping.
- 2.36 Issues to consider when selecting ecological resources for further investigation include:
- a. Whether the feature or resource is sufficiently valuable for an impact to be significant in terms of biodiversity and/or policy and legislation. The following categories of value or potential value should be considered:
    - designated value (as applied to sites);
    - biodiversity value;
    - potential value;
    - secondary or supporting value;
    - social/community value;
    - economic value; and
    - legal protection.
  - b. Whether the feature or resource is likely to receive a significant adverse impact.
- 2.37 These issues are discussed in more detail in Chapters 3 and 4 respectively, where guidance is provided on methods for identifying important sites, habitats or species and determining whether impacts are significant.

### *Detailed survey and research requirements*

- 2.38 Having completed the initial assessment, it should be possible to identify any additional data required to predict impacts more fully. This may include circumstances in which it is agreed that existing data requires updating. The geographic coverage and timing of further ecological studies should be agreed at the scoping stage. These can be revised later if necessary, as progressively more information becomes available through the assessment process.
- 2.39 Terms of reference for additional studies are based on:
- the area of influence and the timeframe for the proposal;
  - information on ecological resources within the area of influence;
  - timeframe for all phases of the proposal; and
  - information gaps/survey needs to assess impacts and their significance.
- 2.40 Standard survey methods should be used wherever appropriate, so that results can be compared with those arising from other investigations. Details of how methods have been tailored to meet the needs of the study should be included. If the method used varies from accepted good practice this should be noted and the effect on the reliability of the results discussed.

### **The Scoping Report**

- 2.41 The results of the scoping exercise can be presented as a scoping report. The level of detail included may vary depending on the stage at which it is produced, but the scoping report, should present a clear case for any further studies required and summarise the

proposed approach. It should explain the sources of information used and summarise the results of any consultations carried out, as well as results of literature searches, site-visits and baseline ecological studies. A good scoping report should enable all the players in the EclA process to agree the range of ecological issues for consideration, as well as the survey techniques, methods for assessment and proposed timeframe.

- 2.42 The scoping report should explain what significant ecological impacts are anticipated and how these will be addressed through the remainder of the EclA process. If a scoping report is not produced, all this information should be included within the final report/ES. This should detail how consultees' comments were responded to in defining the scope of the EclA, to justify the approach taken.

## 3. DETERMINING VALUE

### Introduction

- 3.1 This chapter provides guidance on how to assign values to ecological features and resources, including those that have been designated for their nature conservation interest.
- 3.2 The value that is attached to an ecological resource influences:
- Screening: whether potentially affected features or resources are sufficiently valuable to merit an EIA.
  - Scoping: whether or not to include the resource in the detailed assessment. **Box 8** provides a checklist for identifying valued ecological resources.
  - Deciding what mitigation is appropriate. This is described in more detail in Chapter 5.
  - Considering legal and policy implications. See Chapter 6 for guidance on how this applies.
- 3.3 Valuing ecological features and resources is a complex and subjective process making it impossible to provide definitive guidance about how value should be determined. Therefore, this chapter summarises key considerations to take into account when applying professional judgement to assign values to ecological features and resources.

### Geographic frame of reference

- 3.4 For consistency in assigning value, it is recommended that the following geographic frame of reference is recommended for use in any EclA. The resource or feature is considered or valuable, (or has potential to be valuable) on the following scale:
- International;
  - UK;
  - 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; and/or
  - within immediate zone of influence only.
- 3.5 This should be adapted to reflect local circumstances. For example, there are no Parishes or Districts in Scotland.
- 3.6 Where an EclA is part of a wider assessment, other approaches may have been used to assign levels of importance. To carry out comparative assessments, terms should be translated to a common geographical scale if possible, so that the legal and policy consequences of a significant impact can be clearly understood. This is illustrated in Appendix 1, where the terminology required by the Transport Assessment Guidance has been translated into the value levels described above.
- 3.7 Guidance on ecological assessment tends to set out categories of ecological value or nature conservation value that derive from a geographical framework (international to local) together with examples of the ecological features or resources that qualify for each category. Such examples work well with designated sites (for example, SPAs, SSSIs and SINC)s). The extension of such a system to undesignated features (e.g. an ancient woodland) or to species requires extensive explanation and definition, making such a table unworkable. The size, conservation status and the quality of features or species are all relevant to the determination of value. Furthermore, the value of a species may change depending on whether it is being assessed in the south of England or the north of Scotland, reflecting different ecological contexts. Consequently, the boundaries between the different geographical levels of value become difficult to define with precision. To reach such judgements, ecologists dealing with a project should take advice from experts who know the locality of the project, as well as the distribution and status of the species or feature in the vicinity.

## Designated sites and features

- 3.8 Some sites have already been assigned a level of nature conservation value through designation. The reasons for this designation need to be taken into account in EclA. Key published guidance on selecting designated sites is included in Box 10.

### Box 10: Key guidance on selecting designated sites

- Brown, A.E., Burn, A.J., Hopkins, J.J. and Way, S.F. (1997). *The Habitats Directive: selection of Special Areas of Conservation in the UK*. Report 270. JNCC, Peterborough<sup>xxxv</sup>.
- Stroud, D.A., Mudge, G.P. & Pienkowski, M.W. (1990). *Protecting internationally important bird sites*, NCC Peterborough<sup>xxxvi</sup>.
- Nature Conservancy Council (1989) *Guidelines for the Selection of Biological SSSIs* (Nature Conservancy Council, Peterborough) and supplements published by JNCC<sup>xxxvii</sup>.
- Ratcliffe, D.A. (ed.) (1977) *A Nature Conservation Review*. Two vols. Cambridge University Press, Cambridge<sup>xxxviii</sup>.

- 3.9 Internationally important sites include: SACs, SPAs and Ramsar sites. Sites for which the process of designation has commenced (e.g. potential SPAs, Ramsar sites and candidate SACs) should be given the same consideration as designated sites.
- 3.10 World Heritage Sites (WHS) are designated by UNESCO and are of international importance for their cultural heritage (e.g. City of Bath, Hadrian's Wall) and/or natural heritage (e.g. Dorset and East Devon Coast, Giant's Causeway and Causeway Coast, St Kilda). Ecological features and resources within these sites may not necessarily be a reason for their designation (for example, the woodlands lying within the boundary of the Ironbridge Gorge WHS designated for its cultural heritage). Sites designated by UNESCO as Biosphere Reserves (e.g. Braunton Burrows, North Norfolk Coast, Dyfi estuary, Beinn Eighe) are of international importance for the conservation of biodiversity, but will contain features of varying importance for nature conservation depending on their location in the core area, the buffer zone or the transition area of the Biosphere Reserve<sup>xxxix</sup>.
- 3.11 Nationally important sites are designated as SSSI in England, Scotland and Wales or as ASSI in Northern Ireland.
- 3.12 Some Local Authorities, County Wildlife Trusts and others have designated sites that are of importance at lower levels (e.g. county, district/borough, etc.). Whilst a variety of terms are used to describe these sites they are referred to collectively as Sites of Importance for Nature Conservation (SINCs) in this report.
- 3.13 Where a feature has value at more than one level, it should be valued at the highest level, e.g. a site designated both as an SPA for internationally important features and as an SSSI for nationally importance features. In this instance, the site should be valued in the assessment as being of international value reflecting its SPA designation. Other features of the site that are not the reasons for its designation as an SPA should be assessed and valued accordingly.
- 3.14 It is possible that ecologists undertaking ecological assessments may identify areas that are not currently designated, but which they consider would meet the criteria for designation at a particular level. Conversely, there may be occasions when a site is no longer considered to meet the criteria for designation. In the latter case, the potential to recreate the lost interest must be taken into consideration (paragraph 3.44). In both sets of circumstances, ecologists should explain their rationale fully in the assessment and if possible discuss their conclusions with the relevant designating authority. If it is agreed that the site merits a different valuation, this should be reflected in the assessment. If agreement cannot be reached, the issues must be explained fully in the EclA. Where there is doubt, a precautionary approach should be taken and the current designated value used.

### Tree Preservation Orders (TPOs)

- 3.15 TPOs can be applied to all types of trees, including hedgerow trees, but not to hedges, bushes or shrubs. A TPO can be applied to one or more trees, an area of trees, or woodland. TPOs are used by local planning authorities (LPAs) to protect selected trees and woodlands if their removal would have a significant impact on the local environment and its enjoyment by the public. LPAs are advised to develop

ways of assessing the 'amenity value' of trees in a structured and consistent way, taking into account the following key criteria<sup>xi</sup>:

- visibility - the extent to which the trees or woodlands can be seen by the general public;
- individual impact - relating to its size and form, its future potential as an amenity, taking into account any special factors such as its rarity, value as a screen, or contribution to the character or appearance of a conservation area (this can be taken to refer to building conservation areas); and
- wider impact - the significance of the trees in their local surroundings should also be assessed, taking into account how suitable they are to their particular setting, as well as the presence of other trees in the vicinity.

3.16 These amenity-related criteria do not incorporate any specific considerations of ecological value. The value of trees with TPOs should be assessed as set out above for any other habitat/habitat feature, or within the context of the value of any species that they support. The legal issues relating to TPOs are often addressed in the landscape section of an EIA, but ecologists should be aware of the legal protection they offer.

### Hedgerow Regulations

3.17 The Hedgerows Regulations 1997<sup>xii</sup> provide arrangements for local planning authorities in England and Wales only to protect important hedgerows by controlling their removal through a system of notification. To be 'important' hedgerows must satisfy a number of criteria in respect of length, age, location and importance. A hedgerow is 'important' if all or part of the hedgerow has existed for 30 years or more, and meets at least one of the criteria in Part II of Schedule 1, which is divided into 'Archaeology and history' and 'Wildlife and landscape'. The *Hedgerow Survey Handbook*<sup>xiii</sup> is available from Defra and is on the English Nature website. Whilst the Regulations are not applicable in circumstances under which many EclAs are undertaken, this handbook and the Regulations are useful in valuing hedgerows and the appendices contain 'standard' blank field survey forms as well as a form for a Hedgerow Regulations survey.

### Biodiversity Value

3.18 There are various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity. These include:

- animal or plant species, subspecies or varieties that are rare or uncommon, either internationally, nationally or more locally;
- endemic species or locally distinct sub-populations of a species;
- species on the edge of their distribution, particularly where that distribution is changing as a result of global trends and climate change;
- notably large populations of animals or concentrations of animals considered uncommon or threatened in a wider context;
- species-rich assemblages of plants or animals;
- ecosystems and their component parts, which provide the habitats required by the above species, populations and/or assemblages;
- plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types - these will include examples of naturally species-poor communities; and
- habitat diversity, connectivity and/or synergistic associations (e.g. networks of hedges and areas of species-poor pasture that might provide important feeding habitat for rare species such as the greater horseshoe bat).

3.19 Consultation, especially with local specialists, can be crucial for identifying less obvious important resources and features. The relative ecological importance of different ecological features and resources in the landscape may also change in response to changing conditions. For example, climate change could increase the need for large-scale habitat networks that are designed to facilitate movement of species through the landscape to colonise suitable areas.

3.20 Some published approaches to assessment of importance and value are set out in Box 11.

Box 11: Some approaches to assessing importance and value

- Quality of Life Capital (2001). Methodology developed by the Countryside Agency, working with English Nature and the Environment Agency.<sup>xliii</sup> (This approach incorporates the concept of substitutability and should be applied to ecological resources with care.)
- Treweek J (1999) Ecological Impact Assessment. Blackwell Science, Oxford.
- Collis and Tyldesley (1993) Natural Assets: Non-statutory Sites of Importance for Nature Conservation, The Local Government Nature Conservation Initiative<sup>xliiv</sup>.

3.21 The following sections explain in more detail how the relative value and importance of ecological resources and features can be determined.

### **Valuing Habitats**

- 3.22 The value of areas of habitat and plant communities should be measured against published selection criteria where available. For example, the Habitats Directive 1992 lists habitats (annex I) and plant communities (annex II) of European importance whose conservation requires the designation of SACs. The Guidelines for the selection of biological SSSIs<sup>xliv</sup> sets out the criteria for habitat or plant communities to be designated as of national importance. Some Local Authorities and Wildlife Trusts have prepared criteria for the selection of SINC. Where areas of a habitat or plant communities do not meet the necessary criteria for designation at a specific level, the ecologist may consider the local context if appropriate, but should take into account potential value, (paragraphs 3.44 – 3.47).
- 3.23 Habitat Action Plans (HAPs) have been developed for numerous habitats as part of the UK and other Biodiversity Action Plans (BAPs), (e.g. local BAPs and organisational BAPs such as that produced by British Waterways for the inland waterway network). The purpose of these HAPs is to guide conservation action for the habitats concerned. That a HAP has been prepared should simply reflect the fact that the habitat concerned is in a sub-optimal state (and hence that action is required). It does not imply - and was never intended to imply - any specific level of importance for the habitat. The value of any area of habitat covered by a HAP should therefore be determined as set out above.
- 3.24 The only exception to this should be where a HAP states that all areas of a particular habitat should be protected. In such cases, ecologists may decide that it is appropriate to treat applicable areas as being important at the level of the BAP in question. For example, if a county BAP identifies an action to protect all areas of a particular habitat (where there is no similar recommendation in the UK, national or regional BAP), each area could be considered to be of county importance. It should be noted that, some BAPs do not qualify their recommendations about specific habitats, for example in relation to the size of habitat areas. Some interpretation may be needed to avoid obvious anomalies, for example, it may be inappropriate to classify a small patch of reedbed within a gravel pit as of county importance just because a county BAP action proposes the protection of all reedbeds.
- 3.25 BAPs are also useful in that they identify current factors causing loss and decline of particular habitats, e.g. pollution, fragmentation, etc. They can flag up important development types/impact types that should be considered in EclAs.
- 3.26 Ancient woodlands are identified on some county inventories and may be designated at different levels. Ecologists may consider them to be important even if not designated, in which case the ecologist should assign a level of value that reflects their biodiversity, using whatever value scale has been adopted. A special case can be made for very mature habitats such as this, which cannot be restored or created within a reasonable time frame.

### **Valuing Species**

- 3.27 Many species need to be considered as part of EclAs because the proposal being assessed could result in the contravention of the law, e.g. for species protected under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended).
- 3.28 This part of the guidance deals with species that need to be assessed because they are of biodiversity value rather than because they are legally protected (although some species may fit in both categories). Legal issues are discussed in paragraphs 3.58 – 3.61.
- 3.29 In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. A non-mobile species can generally be assumed to occur regularly on a site, even after just one recent reliable record; records over a longer

period may be needed for mobile species. English Nature often requires five years of records before determining the value of a site. It will be necessary to discuss the period over which data are needed with the relevant country conservation agency, if there is a likelihood of there being an impact on a population or group of international importance.

- 3.30 Rarity is an important consideration because of its relationship with threat and vulnerability. Some species are inherently rare, so it is necessary to look at rarity in the context of status. A species that is rare and declining should be assigned a higher level of importance than one that is rare but known to be stable.
- 3.31 There are many species in decline throughout the UK. Many of those for which the decline is most serious are the subjects of Species Action Plans (SAPs) in the UK BAP. Other species are the subject of action plans in sub-national BAPs.
- 3.32 The purpose of SAPs is to guide conservation action for the species concerned. As with habitats, the existence of a SAP should reflect the fact that the population of the species is in a sub-optimal state. It does not imply - and was never intended to imply - any specific level of importance for the species.
- 3.33 The value of the population of a species covered by a SAP should be determined as set out above for BAP habitats. The only exception to this should be where a SAP states that all populations of a species should be protected. In such cases, ecologists may decide that it is appropriate to treat relevant populations as being important at the level of the BAP in question. Other than in this context, the only relevance of BAP species to EclA is normally in the context of guiding the development of proposals for habitat creation/enhancement. As for habitats, SAPs can be useful in identifying development types/impact types that should be considered for particular species.
- 3.34 Inclusion of species in lists of declining species (e.g. the list of Birds of Conservation Concern<sup>xlvi</sup>) is not in itself a sufficient criterion for assigning a level of value to the species concerned. This is because such lists include species in decline for a number of different reasons and ecological value can vary between listed species.
- 3.35 Other rarity-related evaluation criteria include the need to protect populations where the UK holds a large or significant proportion of an international species, e.g. a European population. For example, stone curlews are very abundant in Majorca but are afforded little protection; in mainland Spain and most of Europe they are in catastrophic decline. The Majorcan population should be considered to have very high value, as it essentially represents the 'European Ark' for this species.
- 3.36 A statutory basis for species and habitats listed in BAPs is provided by Section 74 of the Countryside and Rights of Way (CROW) Act 2000 in England and Wales. The Section 74 list of habitats and species are those the Secretary of State, following consultation with English Nature, considers are of principal importance for the conservation of biological diversity in England<sup>xlvii</sup>, in accordance with the 1992 UN Convention on Biological Diversity<sup>xlviii</sup>. HAPs and SAPs under the UK Biodiversity Action Plan are already in place or under preparation for all the listed habitats and species. The Biodiversity Strategy for England<sup>xlix</sup> sets out the means, by which the Government will comply with its duty under Section 74 and to take, or promote the taking by others, steps to further the conservation of the listed habitats and species, including through the continued implementation of the Action Plans.
- 3.37 The Section 74 List for Wales<sup>1</sup> is published and differs from the England list in that it omits species that are extinct in Wales, or have never occurred, and adds a few distinctively Welsh ones.
- 3.38 The Nature Conservation (Scotland) Act 2004 requires Scottish Ministers to publish a list of habitats and species considered to be of principal importance for biodiversity; this is due to be published at the end of 2005. The Wildlife (Northern Ireland) Order 1985 is currently under review.
- 3.39 For common species it may not be necessary to protect all sites where the species occur (see discussion above relating to BAP species). Such listings assist in ecological valuation but must be reviewed on a case by case basis together with other considerations pertinent to value.

## Large populations/important assemblages of species

3.40 Guidance is available for a number of species groups explaining how to identify populations of sufficient size for them to be considered of national or international importance e.g. dragonflies in the Guidelines for the selection of SSSIs.

## Injurious and legally controlled weeds

- 3.41 Some species are legally identified as notifiable weeds under the Weeds Act 1959, or are controlled by the Wildlife and Countryside Act 1981 (e.g. Japanese knotweed, giant hogweed). These must be controlled, chiefly for public health and commercial reasons.
- 3.42 Five weed species are proscribed as injurious in the Weeds Act 1959 (common ragwort, broad-leaved dock, curled dock, creeping thistle, spear thistle). The Act requires occupiers of land to undertake measures to control their spread. The Defra website has a colour guide 'Identification of Injurious Weeds'<sup>li</sup>. The Ragwort Control Act 2003 amends the Weeds Act; the related code of practice on how to prevent the spread of common ragwort<sup>lii</sup> contains useful advice, including the identification of risk in order to prioritise control measures.
- 3.43 The presence of such species may be assessed as being an ecological, social or commercial dis-benefit, although they may have some ecological merit. Advice should be provided on the legal consequences of their presence and the ecological impacts assessed in this context.

## Potential value

- 3.44 The Habitats Directive 1992 requires Member States to restore European features where they are not of favourable conservation status. The value of such an area must be assessed in relation to the ecological feasibility of restoring it to favourable conservation status, or of enabling another area to be so restored. This means that, even a plant community currently in poor condition may be considered to be of international importance, if there is a reasonable chance that it can be restored to higher value in future. In practice, decisions about what 'reasonable chance' implies in a given situation should be taken in consultation with the relevant statutory nature conservation agency. Potential value is included as a criterion for evaluation by both Ratcliffe (1977)<sup>liii</sup> and in the Guidelines for selection of biological SSSIs page 34.
- 3.45 This approach to potential value has been adopted in some BAPs and to the restoration of habitats of European Importance by the Habitats Directive. If a particular area of land is subject to a HAP, with existing detailed plans for enhancement or habitat creation and an associated delivery mechanism, and if the chance of failure is low, then it may be appropriate to value the site as if the intended resource already existed.
- 3.46 Although it is difficult to assign a potential value, the EclA team should be able to agree a value with reference to national and local guidance on the value of the potential habitat and consideration of the likelihood of this potential being realised. If this is not possible, the reasoning behind the value assigned should be clearly explained.

## Secondary or supporting value

- 3.47 Some features currently of no particular ecological interest in themselves may nevertheless perform an ecological function, e.g. because they act as a buffer against negative impacts, or because they enable in some other way the effective conservation of a more valuable feature. For example, an area of scrub may be included in a calcareous grassland SSSI to act as a buffer from agricultural spraying on adjoining farmland. In this instance, the scrub performs an important ecological function in protecting a feature of national importance. Thus, the importance of a feature may in fact depend on its role within a wider system, as well as the extent to which this role may be assumed by another feature.

## Social/community value

- 3.48 People derive benefits from biodiversity in various ways, including:

- recreational enjoyment of hunting or fishing;
  - the use of habitat areas for the purpose of learning about wildlife;
  - sites that provide the only visually, physically and/or psychologically accessible area of semi-natural green-space for a local community;
  - a population of a species that is enjoyed each year by large numbers of local people, e.g. a patch of bluebells in a local woodland; and/or
  - a population of woodland birds that are valued visitors to bird tables in a large number of adjoining gardens or schools.
- 3.49 Valuing the extent to which a site and its wildlife provides a resource that people use or enjoy is often considered as part of non-statutory nature conservation site-designation systems (see below). This aspect is often neglected in ecological assessments, as no one member of the team feels able to fully address the issues.
- 3.50 It may help to separate 'community' benefits from those related to conservation of biodiversity in order to ensure that all potentially significant values are recognised. They can then be considered in developing mitigation/compensation/enhancement measures and, ultimately, in the decision-making process.
- 3.51 Having identified the socially important sites/species, the ecologist should carry out the assessment of how the ecology of these sites/species might be affected by the proposal. The social consequences of the ecological changes should then be assessed as part of the community assessment. IEEM is hoping to produce guidance on valuing social benefits in future.
- 3.52 The criteria that have been used by local authorities, County Wildlife Trusts and others in designating 'non-statutory sites' of nature conservation value sometimes reflect social as well as ecological considerations. In such cases, the social value that is attached to a site may be defined on the basis of the level of importance at which the site has been designated (e.g. county, district etc). In other circumstances, it may be necessary to make a judgement about the value of the site based on other criteria, such as the extent to which the site is used by local people and others and the availability of other accessible green space in the vicinity. Collis and Tyldesley (1993) also deal with these issues.
- 3.53 It should be noted that even where designation systems reflect social values, they may not have involved a comprehensive survey of the social value of all green spaces within the relevant area. As a result, the ecological assessment may identify previously unrecognised (and un-designated) sites of social importance.
- 3.54 In certain circumstances, a species population may be considered to be of particular social value. This could apply, for example, to a large patch of bluebells within an area of open space, or to a population of common woodland birds that is the main source of avian visitors to bird tables in large numbers of adjoining gardens. It will sometimes be appropriate to give a level of social value to such species populations, which in turn may justify these species being subject to detailed assessment as part of the EcIA. Wherever possible, subjective judgement about social value should be supported by comment from the Local Authority or even surveys of opinion by local residents if the issue is sufficiently critical.

## **Economic value**

- 3.55 Economic implications may result from impacts on certain ecological features and resources that are financially valuable, for example:
- populations of shell fish in estuaries;
  - salmonid fisheries;
  - populations of cyprinid fish for angling;
  - urban green space might play a valuable role in contributing to the health and wellbeing of local communities in that it reduces sick leave, with consequent economic benefits;
  - rare breeding birds at publicly accessible breeding sites that attract large numbers of visitors, who bring economic benefits to the local economy (e.g. ospreys at certain sites in Scotland); and
  - red deer in areas where hunting or stalking takes place.
- 3.56 Ecologists should be proactive in identifying situations where specialist input might be required. This will ensure that economic implications of ecological change are properly included in an assessment. Ecologists and economists may need to work together to identify economically important resources, but the

economist should assign values to them. The ecologist will be responsible for describing the ecological changes resulting from the proposal, which the economist will use to assess the economic impacts.

- 3.57 Criteria relating to economic value typically reflect considerations such as the contribution to the economy derived from the ecological resource, e.g. the number of jobs that are supported. These need to be considered in relation to direct 'upstream' and 'downstream' economic activities. This would normally be done in the context of values adopted in the wider socio-economic assessment. Guidance on this subject is beyond the scope of this document.

## Legal issues

- 3.58 It is important to identify ecological resources or features that are subject to specific legislation. As ecological resources or features can be subject to more than one piece of conservation legislation, designation can be at more than one level. The recommended approach is explained in paragraph 3.13.
- 3.59 Some mechanisms for legal protection or designation indicate what type of information is required to address ecological impacts (e.g. sites protected under the Habitats Directive). In all cases, legal and other guidance should be followed to determine whether a proposal will cause any contravention of legal status or protection, or have a significant effect on the integrity of a system, resource or feature.
- 3.60 The legal protection of some features does not necessarily reflect their biodiversity value (e.g. badgers under the Protection of Badgers Act 1992, foxes, etc, under the Wild Mammals (Protection) Act 1996, trees protected under Tree Preservation Orders and hedges protected under the Hedgerow Regulations 1997). In addition to ensuring that advice is provided on the necessary legal provisions, the approach described in paragraphs 3.18 *et seq* should be used to evaluate the biodiversity value of the feature (rather than just using the legal status alone) in order to provide advice on the policy implications of any impacts.
- 3.61 As discussed in 3.41, some species are legally identified as notifiable weeds, or are controlled by the Wildlife & Countryside Act 1981. These must be controlled, chiefly for public health and commercial reasons. Advice should be provided on the legal and practical consequences of their presence, and the ecological impacts assessed in this context.

## Multi-functional features

- 3.62 Some features may be valuable ecologically, socially and/or economically, such as salmon. In this instance, the impact of a proposal on all three aspects should be assessed separately before an integrated appraisal is carried out.

## 4. IMPACT ASSESSMENT

### Introduction

- 4.1. This chapter explains how significant ecological impacts can be identified. The assessment of ecological impacts is required at the following stages:
- in scoping, a broad assessment is needed. This forms the basis for selecting those valued ecological resources to be subject to detailed assessment due to likely significant impacts (see Chapter 2);
  - during the evolution of the proposal, to identify the need for impact avoidance and mitigation and opportunities for enhancement;
  - after the mitigation strategies have been fully devised and their likely success considered, the residual impacts are assessed; and
  - finally, if significant impacts are still likely, it may be necessary to consider the need for and value of ecological compensation.
- 4.2 The starting point for any assessment is to determine which ecological features or resources are of sufficient value that an impact upon them could be considered significant. The determination of value should make use of the guidance in Chapter 4. This chapter does not specify an approach to defining the threshold level of value, as this will differ depending on the situation. Ideally the threshold value should be agreed through consultation during scoping, see paragraphs 2.35 and 2.36. For the valued ecological resources or features that have been identified (i.e. above the threshold), the next step is to determine the ecological implications of the proposed development (i.e. the ecological impacts). These impacts should be clearly identified before the legal, policy, social or economic implications of the development are considered.
- 4.3 The following guidance is in accordance with the mandatory requirements of the UK EIA Regulations.

### Predicting Ecological Impacts

- 4.4 Having identified the activities likely to cause significant impacts (see Chapter 2) it is then necessary to identify associated changes and to assess their implications for valued ecological resources. The predicted extent, magnitude, duration, reversibility, timing and frequency of impacts should be explained and the levels of certainty attached to each prediction given. It is also important to consider the possibility that cumulative impacts may occur (see paragraphs 4.20 *et seq*). Impacts should be considered both alone and cumulatively for each relevant ecological feature. The possible effects of other plans, proposals or projects should also be considered.
- 4.5 This guidance recommends that the process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Some of the elements that may be considered are identified in Box 12.

### Characterising Ecological Impacts

- 4.6 When describing impacts on ecosystem structure and function, reference should be made to the following:
- confidence in predictions (levels of uncertainty);
  - extent;
  - magnitude;
  - duration;
  - reversibility;
  - timing and frequency; and
  - cumulative effects.

Box 12: Key aspects of ecosystems to consider when predicting impacts.

<b>Ecological Resources</b>
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<p>Territory; hunting/foraging grounds.  Roost sites; breeding sites; shelter.  Food and water (quantity and quality).  Soil mineral nutrients and hydrochemistry.  Solar radiation and gaseous resources.</p>
<p><b>Stochastic processes</b></p>
<p>Flooding, drought, wind blow and storm damage, disease, eutrophication, erosion, deposition and other geomorphological processes, fire and climate change.</p>
<p><b>Ecological processes</b></p>
<p>E.g. predation, population dynamics, mortality rates, survival rates and strategies, population cycles and reproduction rates.  Competition, colonisation, succession, establishment, breeding, feeding, elimination of wastes, protection and camouflage.  Over-wintering behaviour and hibernation, migration, dispersal and genetic exchange.  Nutrient-cycling.</p>
<p><b>Human Influences*</b></p>
<p>Animal husbandry, cutting, burning, mowing, draining, irrigation, culling, hunting, excavations, maintenance dredging, earth shaping, ploughing, seeding, planting, cropping, fertilising, pollution and contamination, use of pesticides and herbicides, introduction of exotics, weeds and genetically modified organisms and disturbance from public access and pets.</p>
<p><b>Historical Context</b></p>
<p>Natural range of variation over recorded historical period.  Irregular perturbations beyond normal range (such as very infrequent storm events).</p>
<p><b>Ecological relationships</b></p>
<p>Food webs, predator-prey relationships, herbivore-plant relationships, herbivore-carnivore relationships, adaptation, dynamism and climax.</p>
<p><b>Ecological role or function</b></p>
<p>Decomposer, primary producer, herbivore, parasite, predator, keystone species.</p>
<p><b>Ecosystem properties</b></p>
<p>Fragility and stability, carrying capacity and limiting factors, productivity, community dynamics.  Connectivity.  Numbers in a population or meta-population, minimum viable populations.  Sex and age ratios.  Patchiness and degree of fragmentation.</p>
<p>* <i>Note:</i> Many of our semi-natural habitats and wild species have co-evolved with humans over many centuries and are adapted to traditional cultural management practices that now sustain their current conservation status.  (Based on Oxford 2001)</p>

### **Confidence in predictions**

- 4.7 It is important to consider the likelihood that an impact will occur as predicted. The limitations to certainty should be described and the consequences for confidence in predictions must be stated clearly. A qualitative description is preferable to an arbitrary scale. In some cases, ongoing survey or monitoring may be required to refine predictions or support mitigation proposals.

### **Magnitude**

- 4.8 Magnitude refers to the 'size' or 'amount' of an impact, determined on a quantitative basis if possible, e.g. 20 decibels of noise, three otters killed per year on a road, 20 ha of habitat loss.

### **Extent**

- 4.9 The area over which the impact occurs is the extent of that impact. For example, a 20 decibel increase in noise (magnitude) over a 3 ha area (extent).

### **Duration**

- 4.10 The time for which the impact is expected to last prior to recovery or replacement of the resource or feature. This should be defined in relation to ecological characteristics (for example species lifecycles) rather than human timeframes. For example, five years, which might seem short-term in the human context, may be very long-term in the life of a dragonfly.
- 4.11 The duration of an activity may differ from the duration of impact. For example, if short-term construction activities cause disturbance to birds during their breeding period, there may be longer-term implications due to a failure to reproduce in the disturbed area during that season.

### **Reversibility**

- 4.12 The terms permanent and temporary are often used to describe impacts. For the purposes of this guidance, a permanent impact is one which is ecologically irreversible (in a reasonable timescale) or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one for which spontaneous recovery is possible, or for which effective mitigation is both possible and intended.

- 4.13 In some instances, longer term changes may be reversible.

E.g. Consider two of the potential impacts arising from the placement of a temporary access through an ancient wood that is subsequently allowed to grow over.

The change experienced by common woodland birds of the loss of food and shelter in the woodland edge may be reversible in as little as 10 years, as these resources will be replaced once the access route has grown over. Many birds are sufficiently mobile and adaptable to accommodate this change with no significant impact on populations.

But, the impact on ground flora along the route of the access may be irreversible (or effectively so) with machinery used in construction of the access having caused compaction of the fragile woodland soils on which they depend. It is possible that with time, some species may be able to colonise the route of the access track once more, however, subtle changes in the community present are likely to persist for a long period of time.

### **Timing and frequency**

- 4.14 Some changes may only cause an impact if they happen to coincide with critical life-stages or seasons (for example, the bird nesting season). This may be avoided by careful scheduling of the relevant activities, e.g. by the implementation of an EAP that specifies important constraints in relation to the timing of works.
- 4.15 The frequency of an activity and/or impact should also be considered. For example, there may be occasions when a single person walking a dog will have very limited effect on nearby waders using wetland habitat. However, if numerous walkers subject the waders to frequent disturbance, then feeding success may be significantly reduced. In extreme cases the birds could be permanently displaced.

### **Integration of impact characteristics**

- 4.16 In order to assess significance (as discussed in paragraphs 4.23 *et seq*) it is necessary to consider impacts in their entirety, taking into account all the impact characteristics that have been described in the preceding sections.

E.g. An assemblage of breeding woodland-edge birds assessed as of borough value will experience, a long-term, but reversible increase to 20 decibels of noise (moderate confidence in this assessment of magnitude, based on noise/traffic assessment), for 3 hours per day (high confidence in this assessment of timing and frequency, based on traffic assessment) experienced over a distance of 5 km from a road, within which there is 5 ha of quality breeding habitat (moderate confidence in this assessment of extent, based on noise/traffic assessment).

### **Cumulative effects**

- 4.17 The ecological impacts associated with a proposal must also be considered against the background of other threats and impacts affecting the same resources and features, or the same area. The ecologist should consider whether there may be cumulative impacts by taking account of:
- other current proposals;
  - projects that have been completed; and
  - natural trends.
- 4.18 The approach to assessment of cumulative effects should be agreed between all relevant parties during scoping. Close liaison is required between the proponent team and the LPA and/or agencies involved.
- 4.19 Some of these issues may be considered by competent authorities in Strategic Environmental Assessments (SEAs) or Sustainability Appraisals of their plans and programmes, the relevant conclusions of which should be incorporated as appropriate. Guidance on SEAs can be found in Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners (June 2004)<sup>liv</sup>.
- 4.20 Whereas ‘cumulative effects’ are those actually experienced by an ecosystem, ‘in-combination’ effects (i.e. those assessed during an ‘appropriate assessment’ under the Habitats Regulations) are only those arising from formal proposals that have been completed, are currently in progress or can be reasonably expected to take place. This is explained in Habitats Regulations Guidance Note 4 ‘Alone or in combination’ issued by English Nature<sup>liv</sup>.
- 4.21 Cumulative ecological impacts may occur due to:
- concentration of many activities in one area (e.g. thresholds of disturbance exceeded);
  - concentration of activities in time (e.g. repeated disturbance preventing breeding and causing longer term population decline);
  - disproportionate effects on one ecological resource or feature (preference to develop breeding beaches for tourism);
  - many activities affecting a high proportion of a species’ range at one time, thereby reducing availability of undisturbed feeding habitat; and
  - stochastic events (e.g. flooding, drought).
- 4.22 Box 13 gives an example of the cumulative effects that would need to be considered in an assessment for a particular scenario, where in-combination effects are likely.

### Box 13: Example scenario for cumulative effects assessment

#### *The scenario*

An EIA is being carried out in England for a proposed extension to an existing port facility within an estuary. The extension will involve the removal of an area of inter-tidal mud and dredging of sub-tidal mud, both of which adjoin an SSSI. Expansion of another port in the same estuary is already underway.

#### *Analysis*

The scope of the cumulative effects assessment would be discussed with the competent authority, English Nature and any other relevant agencies, but is likely to include assessment of the:

- Cumulative impacts on important ecological resources or features arising from each proposal, e.g. effect on feeding opportunities of wading birds, arising both from the erosion of inter-tidal habitats and from increased disturbance due to increased port traffic.
- Combined impacts of the port extensions, e.g. assessment of the erosion or accretion of inter-tidal habitat occurring due to the combined dredge for the two projects. This occurs because the combined dredge affects the overall morphology of the estuary, which in turn affects the hydraulic processes that act on the inter-tidal habitats of the SSSI.
- Effects of the proposal together with predicted (but yet to occur) effects from completed projects, e.g. long-term erosion of inter-tidal habitats expected to occur as a consequence of the original port, acting together with the inter-tidal habitat erosion predicted to occur as a consequence of the proposed port expansion.
- Ecological and other processes affecting the condition and quality of inter-tidal habitats, e.g. levels of disturbance caused by the visiting public.
- Combined impacts of the port extensions in the context of recognised national and local trends affecting the estuary.

## Assessment of the ecological significance of an impact

### *Approaches for determining significant impacts*

- 4.23 Legislation and policy guidance often require significant impacts to be distinguished from others, although there is little guidance on how this distinction should be made. In this guidance a significant impact, in ecological terms, is defined as an impact (adverse or positive) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative impacts. This assessment may be assisted by reference to conservation objectives where available. If integrity is being considered in the context of a non-designated site, it is necessary to explain how the site is defined and how its conservation objectives have been determined.
- 4.24 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 grades of significance, for example in TAG (see **Appendix 1**).
- 4.25 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), duration and reversibility, as well as the size of the impact in quantitative terms (the definition of the term 'magnitude' as it is used in this IEEM guidance). In such matrices 'magnitude' is ranked into categories such as of 'High/Medium/Low'. Given the fact that 'magnitude' in this context is an amalgam of a number of very different factors, it is very difficult to define these categories. This obstructs easy understanding of the ecological assessment process.
- 4.26 The other axis of such matrices is value. As part of the scoping exercise, the minimum value will have been set, below which features will not be included in the assessment. It may have been determined that features of, for example, local/parish value should be included, as there are relevant policies in the Local Plan. However, this type of matrix will almost always place adverse impacts on a feature of local/parish value into a 'low' significance category. But at the local level, the impact may in fact be significant and the relevant Local Plan policies should be triggered.
- 4.27 A weakness of such a matrix is that it establishes categories of significance (for example (High/Medium/Low) that do not have definitions, nor are there clear boundaries between the different

categories. It is hard to see how decision-makers in a competent authority can confidently distinguish between, for example, an impact of 'medium' significance as against one of 'low' significance.

- 4.28 This guidance promotes a more transparent approach in which an impact is determined to be significant or not on the basis of a discussion of the factors which characterise it. The value of any feature that will be significantly affected is then used to determine the implications, in terms of legislation, policy and/or development control.
- 4.29 Continuing with the example given in paragraph 4.17, for the assemblage of birds valued at borough level, the degradation of 5 ha of quality breeding habitat (determined by considering the integrated impact characteristics and cumulative impacts) would be more likely to be significant if it represented 80% of total suitable habitat in the borough, than if it was just 10%.
- 4.30 If an impact is found not to be significant at the highest geographical level at which the resource or feature has been valued, it may be significant at a lower geographical level. Thus, if the 5 ha of breeding habitat comprised 80% of the resource in the parish, the impact is likely to be significant to the assemblage of breeding birds in the parish, even if it had not been considered significant at the borough level.
- 4.31 If an ecological resource or feature is likely to experience a significant impact, the consequences in terms of development control, policy guidance and legislation will depend on the level at which it is valued. Significant impacts on features of ecological importance should be mitigated (or compensated for) in accordance with guidance derived from policies applied at the scale relevant to the value of the feature or resource. Any significant impacts remaining after mitigation (the residual impacts), together with an assessment of the likelihood of success in the mitigation, are the factors to be considered against legislation, policy and development control in determining the application.
- 4.32 There may be conditions or legal agreements attached to a consent to ensure 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.
- 4.33 An example of how this approach might be applied in practice is given in Table 1.

### **Integrity**

- 4.34 With reference to European sites, the Habitats Directive (Article 6) introduces the term 'integrity' in considering the ecological significance of an impact. Integrity is defined in PPG 9 (Annex C10)<sup>lvi</sup> as: *'the coherence of ecological structure and function, across a site's whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of species for which it was classified'*.
- 4.35 The concept of 'integrity' evolved to deal with ecosystems and can be applied to 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, some of which are illustrated in Table 1. Use of the concept of ecological integrity must recognise that ecosystems are inherently dynamic and can change in time *and* space and that their boundaries are not fixed but are 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 that appear to have little value themselves, when considered in isolation, but nevertheless play an important part in maintaining or supporting the overall value of an ecosystem.
- 4.36 Note that it may not be possible to evaluate impacts in terms of integrity without considering functions and processes acting outside a site's formal boundary, particularly where a site clearly falls within a wider ecosystem.
- 4.37 When assessing potential impacts on SACs and SPAs, integrity may be considered by reference to the published citations and any conservation objectives. Similar information on the features of value and objectives for their conservation is also likely to be available for SSSIs.
- 4.38 However, when evaluating the significance of impacts on sites and ecosystems at sub-national levels of value, it is likely that the description of the ecologically important characteristics of the site or ecosystem will fall to the ecologists. It may also be appropriate where a relevant BAP is available, to draw from it reasonable conservation objectives for those important characteristics.

### **Conservation Status**

- 4.39 It is recommended that the concept of 'conservation status' is used to determine whether an impact on a habitat or species is likely to be ecologically significant.
- 4.40 Again, the Habitats Directive (Article 1, sections (e) and (i)) provide a helpful definition of 'conservation status' for habitats and species. This guidance uses slightly modified versions of these definitions so that evaluation of conservation status can be applied to sites, habitats or species within any defined geographical area:
- 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; and
  - 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.
- 4.41 Conservation status may be evaluated for any defined study area, whether this is local, regional, national or international. The extent of the area used in the assessment will relate to the geographical level at which the feature is considered important. See Table 1.
- 4.42 In some cases, (e.g. for BAP species and habitats) there may be an existing statement of the conservation status of a feature with formal objectives and targets. Most species or habitats will not be described in this way. In this case, the conservation status of each feature being assessed should be agreed between the ecological consultees during the scoping process.

#### Worked Example

- 4.43 Table 1 summarises a worked example in which the changes to a Dartford warbler population (6 breeding pairs) in the event of a road-widening scheme are considered. These are measured where possible and the impacts of the changes for the population are characterised by reference to the key aspects of the ecosystem relied on by the birds. The likely effect on the conservation status of the population is then considered with reference to current status and conservation objectives to determine whether the impacts are significant or not.
- 4.44 In this example, it can be seen that, without mitigation, the conservation status of Dartford warblers in the study area was at risk due to permanent disturbance from people, cats and dogs, which exacerbated losses of breeding habitat, shelter and foraging areas. With the proposed mitigation, the capacity of the habitat to hold this species will be increased and the birds will then be more able to escape disturbance effects and increased predation. On balance it is concluded that, so long as mitigation is provided 'in perpetuity', the abundance of this species will not be reduced and its conservation status will not be affected; there will not be a significant impact. If the mitigation is provided only for a short period, a significant adverse impact is likely.

Table 1: An example of the approach to EcIA: the effect of road widening on a population of six breeding pairs of Dartford warblers (for illustration only, not a real example and other impacts may apply that are not dealt with in the table, e.g. mortality from impact with cars)

Characterisation of Impacts

- Confidence in predictions (levels of uncertainty)
- Extent
- Magnitude
- Duration
- Reversibility
- Timing and frequency

Ecological feature, value, policy and legal framework and factors on which its integrity or conservation status depends	Proposed activity, biophysical change and relevance to receptor in terms of ecosystem structure and function	Characterisation of Impact	Effect on integrity or conservation status, confidence in this assessment and rationale	Mitigation	Residual impact and significance
	<b>Construction Impacts</b>				
<ul style="list-style-type: none"> <li>• <b>Dartford warbler</b></li> <li>• 6 breeding pairs.</li> <li>• National value.</li> <li>• Legal protection – killing, injury, damage/destruction of nest, disturbance whilst breeding.</li> <li>• Hypothetical county BAP prescribes need to maintain and if possible increase the current population, 10 breeding pairs by 2020. Key mechanism is habitat restoration.</li> <li>• Existing habitat provides nesting opportunities but is deteriorating – some heather and gorse being out-shaded by encroaching birch.</li> </ul>	<p>Site clearance</p> <ul style="list-style-type: none"> <li>• Removal of heather and gorse - breeding habitat.</li> <li>• Habitat throughout the site is in overall good condition and stable, though area to be lost is succeeding to woodland and has poor structural diversity, compared to rest of habitat.</li> </ul>	<p>Complete removal of habitat from 1 ha, which is &lt;2% of available breeding habitat. Permanent loss of habitat.</p>	<p>Not significant (95% certainty). Vast majority of better habitat remains. Population likely to be sustained.</p>	<p>Avoid the breeding season. None for this impact alone, but mitigation is proposed in relation to cumulative effects of all impacts on the population of this species (see below).</p>	<p>Not significant.</p>
	<p>Road widening</p> <ul style="list-style-type: none"> <li>• Increased distance from nearest similar habitat.</li> <li>• Connection between suitable habitats is required to encourage expansion of existing population and/or genetic exchange between populations. Hypothetical 50 ha central block of heath supports Dartford warbler but separated fragments of heath do not.</li> </ul>	<p>Existing road is already a barrier to movement. Permanent loss of habitat will increase distance to next block of habitat by 150 m.</p>	<p>Not significant (95% certainty) As the existing road is already a barrier to this species, this does not worsen the existing situation.</p>	<p>None for this impact alone, but mitigation is proposed in relation to cumulative effects of all impacts on the population of this species (see below).</p>	<p>Not significant.</p>

	<p>Noise generated by site clearance and construction for 6 weeks.</p> <ul style="list-style-type: none"> <li>• Change in noise environment within and near bird territories.</li> <li>• Potential effect on audibility of territorial song and hence ability of birds to hold territories and on general stress levels (loud noises). Such effects can extend for over 500 m (see Reijnen <i>et al.</i> 1995).</li> </ul>	<p>The magnitude of the noise is variable but at times there are increases of up to 8 dBA <math>L_{eq24}</math>. Up to 500 m from road includes 25-30% of breeding habitat. The impact is short term and reversible (more so out of breeding season).</p>	<p>Significant (50% certainty) Short term disturbance could reduce the population by up to one third during the year of activity, which might have knock-on effects in the longer term, increasing the risk of decline of the population, or even its loss. Dartford warbler is very susceptible to cold weather and a small population could be wiped out in a severe winter especially if already weakened. There is uncertainty in this assessment as detailed knowledge of effect of short term noise disturbance on breeding performance unknown. On precautionary basis, assume could affect conservation status.</p>	<p>Avoid breeding season.</p>	<p>Not significant.</p>
<b>Operational Impacts</b>					
	<p>Noise generated by increased traffic volume and speeds in perpetuity.</p> <ul style="list-style-type: none"> <li>• Change in noise environment within and near bird territories.</li> <li>• Potential effect on audibility of territorial song and hence ability of birds to hold territories and on general stress levels. Such effects can extend for over 500 m (see Reijnen <i>et al.</i> 1995).</li> </ul>	<p>Permanent mean increase in noise of 2 dBA <math>L_{eq24}</math>. Reijnen <i>et al.</i> (1995) suggests 30% reduction in territories within 500 m.</p>	<p>Significant (95% certainty). From tables in Reijnen <i>et al.</i> (1995), ability of population to sustain itself would be compromised and conservation status will be adversely affected.</p>	<p>This is a nationally important receptor and no-net loss of conservation status must be ensured. Option 1 is to introduce a rotational management scheme in perpetuity for the remaining 49 ha of heather and gorse. Management will improve nesting niches and food availability. This is considered certain to increase carrying capacity of the area and at least maintain 6 breeding pairs. Option 2 is to extend habitat away from road and noise, creating a further 20 ha of suitable habitat and thereby probably increase the population towards 10 pairs in the long-term.</p>	<p><b>Option 1:</b> Not significant.</p> <p><b>Option 2:</b> Significant positive impact.</p>

**Commentary on overall significance on integrity or conservation status of feature (that might be suitable for main text of the ES):**

It can be seen that the main, avoidable impact would be from noise during site clearance and construction during the breeding season. This could reduce the population by up to one third during the year of activity, which would have knock-on effects in the longer term, increasing the risk of decline of the population, or even its loss. This would be contrary to the conservation objectives for the species. (NB this bird is very susceptible to cold weather and a small population could be wiped out in a severe winter.)

Even if this work were completed outside the breeding season, the size of the population of Dartford warblers in the study area would be at risk. The introduction of permanent disturbance from road traffic exacerbates the other small losses of breeding habitat, shelter and foraging areas and would lead to a reduction in suitable habitat. This again would be contrary to the conservation objectives for the species.

However, with the proposed introduction of improved management for the remaining 49 ha of heath and gorse, the capacity of the habitat to hold this species would be increased, and the birds would be better able to escape disturbance effects and increased predation. If this were only done for, say, 10 years, the decline of the population would merely be postponed for that period.

On balance, providing site clearance and construction were undertaken outside the breeding season and the proposed management of the remaining 49 ha were funded in perpetuity, it is considered unlikely that the conservation status of the Dartford warbler population would be affected, and therefore no significant impact would be generated.

With the option of habitat increase by 40%, at a distance from the road and the noise, the net effect would be positively significant. Given the national value of the feature and the relevant BAP policy, implications of this potential benefit should be considered in respect of the application of conditions or legal obligations to any planning permission granted.

## 5. MITIGATION, COMPENSATION AND ENHANCEMENT

- 5.1 Proponents are required to recommend suitable measures to:
- avoid adverse ecological effects - especially those that could be significant;
  - reduce adverse ecological effects that cannot be avoided;
  - where appropriate, compensate for any remaining significant adverse ecological effects; and
  - deliver ecological enhancements.
- 5.2 Wherever possible mitigation measures should be developed and incorporated into a scheme as part of the design process as measures that are fully integrated into a proposal have a greater surety of delivery i.e. design should be an iterative process.
- 5.3 Priority should be given to avoidance of impacts at source, whether through re-design of a proposal or by regulating the timing or location of activities. If it is not possible to avoid adverse impacts, it is necessary to seek measures to reduce them to insignificance, i.e. to maintain or **restore** the conservation status or integrity of the ecological resource or feature. If this is not possible, but the scheme is permitted, compensation may be appropriate. However, compensation carries higher uncertainty and often results in temporary loss of ecological value.
- 5.4 There is a growing body of opinion that there should be more emphasis on the delivery of biodiversity objectives and less on damage limitation (e.g. Oxford, 2001 and PPG9). Opportunities for enhancements should be sought. In some cases, the delivery of biodiversity objectives or other forms of compensation may be secured by utilising or initiating habitat banking schemes.
- 5.5 Due to the uncertainty associated with the success of proposed mitigation (and particularly compensation) measures, evidence should be provided of the effectiveness of recommended mitigation, compensation and enhancement measures and to what extent their success can be guaranteed. If possible, information from similar projects should be used to support statements about the level of success that can be reasonably expected.
- 5.6 The uncertainty associated with a proposal will vary according to a number of factors, including:
- technical feasibility of what is proposed (e.g. experience of projects where the proposed mitigation has been employed or carried out);
  - overall quantity of what is proposed (e.g. is it large enough to be viable; is it of equivalent extent to that of lost habitat?);
  - overall quality of what is proposed (e.g. does it compare favourably with features lost and those whose loss or damage is to be compensated?);
  - level of commitment provided to achieve what is proposed (e.g. is there a realistic understanding of what resources and effort will be required to achieve predicted outcomes?); and
  - timescale over which predicted benefits are to be realised.
- 5.7 Mitigation should be presented in terms of the integrity or conservation status of the resources or features to which it applies. For example, mitigation may be designed to ensure that the status of a species population can be maintained following development, see Table 1. It is then possible to suggest suitable monitoring or follow-up arrangements to determine whether mitigation has in fact been successful and to specify appropriate remedial actions.
- 5.8 There is currently no general legal requirement to implement or monitor the success of mitigation, compensation or enhancement measures. Furthermore, there is no general legal requirement to remedy the situation should any of the above either not be implemented or fail (e.g. due to lack of management).
- 5.9 These guidelines propose that best practice is to include provision for both monitoring and future remediation (should this be required) as far as reasonably possible. Follow-up and monitoring is more likely to take place if it is built into legal agreements and planning conditions to deliver a specified ecological outcome. Ideally, measurable Limits of Acceptable Change (LAC), which set the trigger

thresholds for remedial management action should be agreed by all the ecologists involved in the assessment process.

- 5.10 An EAP is a useful means of pulling the mitigation, compensation, enhancement, management and monitoring proposals together. An EAP may be enforced by legal agreement.
- 5.11 It is often helpful to demonstrate in an ES/assessment report how the proposals have evolved in response to ecological considerations and to indicate how mitigation that has been incorporated into the scheme has enhanced ecological outcomes. An EAP can help track mitigation development, particularly for large or complex projects, and a summary table can demonstrate within an ES how mitigation has been incorporated within the project. Where considered desirable, ES/environmental reports can present the results of impact assessment for scenarios 'with' and 'without' mitigation. Where there is high confidence that mitigation will be implemented and deliver the desired outcomes, then it may be appropriate simply to assess the significance of impacts of the mitigated proposal.

## 6. CONSEQUENCES FOR DECISION MAKING

### Overview

- 6.1 This section considers the point at which the findings of the EclA are applied to the decision making process. By this stage the significant impacts and the value of the affected ecological features and resources will have been determined. The purpose of this stage is to determine whether the mitigated proposal:
- complies with legal requirements e.g. the need to obtain a licence for any work affecting protected species or, the implications of the findings in respect of Regulation 48 of the Conservation (Natural Habitats, &c.) Regulations 1994<sup>lvii</sup>;
  - meets national and local policy goals and objectives; and
  - requires conditions and legal obligations attached to the consent, that deal with detailed design and implementation of the proposal.
- 6.2 The scoping stage presents the first opportunity to make explicit the legal and policy context in which the EclA process should take place. Everyone involved in the process should be fully aware of, and constantly referring back to, the legal and policy context that applies to the area and issues being studied.
- 6.3 Failure 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.
- 6.4 Table 2, at the end of this chapter, identifies many of the sources of relevant legislation and policies and the development control tools available.

### Legal Implications

- 6.5 The legal implications arising out of impact assessment should be made explicit. The ODPM web site sets out key legislation that is likely to be encountered and should be considered during EclA. For example, consents required under the Town and Country Planning Acts, the Wildlife and Countryside Act (as amended) or the Habitats Directive. The proponent may need to provide the evidence to support an 'Appropriate Assessment' in relation to potential effects on the integrity of a SAC or SPA, or Ramsar.
- 6.6 Where an EclA forms part of an EIA, it is crucial that all information relevant to describing all significant ecological impacts is collected prior to the submission of the ES to the decision-maker, and that ecologists advising the decision-maker are confident that this is the case. The decision-maker must obtain all the information to assess and evaluate the likely significant environmental effects of the proposal before it reaches its decision. As has been confirmed in a recent judgement (see Box 14) it cannot adopt a "wait and see" approach or impose a condition requesting further work to identify the likely environmental effects after permission has been granted. It must be sure that all of these have been identified and taken into account before granting planning permission (e.g. ODPM, 2002).
- 6.7 Where the decision-maker considers that the information is insufficient it has the power to require further information, or evidence to verify the information already provided (e.g. under Regulation 19 of the Town and Country Planning (EIA) (England & Wales) Regulations 1999). Working closely with the decision-maker, statutory bodies and other consultees during the assessment process should help reduce the likelihood of the decision-maker needing to exercise this power. Case law in this area is evolving, as illustrated in Box 14.

Box 14: R v Cornwall County Council *ex parte* Jill Hardy (2001)<sup>lviii</sup>

Planning permission was granted for a proposal for which the applicant carried out an EIA and provided an ES. Although it was known that the conditions at the site were those favoured by a protected species, i.e. bats, the applicant did not investigate for their presence. The planning authority, advised by English Nature, imposed a condition requiring the applicant to carry out a survey to establish whether bats were present prior to commencing on site. The Court held that this information should have been included in the ES, otherwise the authority could not comply with the EIA Regulations (Regulation 3(2)). The planning permission was quashed.

## Policy Implications

- 6.8 All parties involved in EclA should be familiar with both the national and local policies that apply to their proposal. Key national policy documents that should be considered during EclA can be found on the ODPM web site. These might include: national and local BAPs, various forms of government planning guidance and advice, relevant Local Development Frameworks and existing Development Plans (including Structure, Local, Waste, Mineral and Unitary Development Plans).
- 6.9 The EclA should be prepared with this national and local policy context in mind. It should aim to provide sufficient information to enable a full and adequate determination to be made in light of these policies.
- 6.10 If the proposal being assessed has emerged from a strategic planning process for which an SEA or Sustainability Appraisal has been undertaken, the results of policy appraisal and review should be available.

## Implications for detailed design and implementation if consent is granted

- 6.11 It is necessary to ensure that the legal and policy implications are carried forward into implementation. This is particularly important when the proposal was made by a different organisation from that which will implement it, such as when a 'design and build contract' is let to implement an outline permission.
- 6.12 EclAs commonly make non-committal statements about how impacts will actually be compensated or mitigated, or how proposed enhancements and gains will be achieved. It is very important for all parties involved in the impact assessment process to understand, and be sure of, the subsequent actions they need to take during the implementation stages of a project that has been subject to EclA. This will mean identifying and designing in detail the measures necessary to actually compensate and mitigate for negative impacts, and also any measures necessary to achieve positive enhancements.
- 6.13 It is important that an applicant is able to demonstrate commitment to the full implementation of the proposed mitigation, enhancement and compensation measures. Commitment can be demonstrated relatively easily through the submission of designs. These will include 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 (e.g. in an EAP).
- 6.14 This information should include:
- details of how funding for the implementation of the proposed measures will be secured;
  - location and extent of the proposed measures shown on appropriate scale plans;
  - a timetable for implementation of design options and integration with various phases of development, e.g. construction, operation, habitation, decommissioning, restoration;
  - expertise of persons responsible for implementing design options;
  - availability of land to adequately implement the design options;
  - adequate provision of all other necessary resources required to implement the design options;
  - a statement of how design options will be secured within the planning process, e.g. through the use of planning conditions and/or planning obligations; and
  - details of proposed liaison with local expertise (by the consultant and/or applicant) and the means by which local people can feed their ideas into any solutions.

- 6.15 If such detail is not provided initially in the EclA, then it must either be provided as a further submission prior to the decision-maker granting approval, or it may be made a condition of the approval, or agreed that it must be submitted within a specified period after approval.
- 6.16 Within the planning process, planning conditions and obligations (for example, Section 106 Agreements in England and Wales or Section 50 Agreements in Scotland) provide enforceable mechanisms to secure the subsequent submission of information for approval. Equally important, these mechanisms provide a means to ensure that identified measures are implemented in full.

Table 2: Ecological, legal and policy implications

Importance of resource or feature	Ecological Implications	Legal Implications	Policy Implications	Implications for Development Control <b>(Detailed Design and Implementation)</b>
<b>Adverse Impacts</b>				
<b>International</b>	E.g. Loss and fragmentation of heathland, causing adverse impact to a SAC and permanent reduction in feeding and breeding habitat for a resident population of sand lizards (protected under Schedule 5 (Wildlife and Countryside Act 1981) and Annex II (Habitats Directive)).	Proposal is unlikely to comply with Regulation 48 of the Habitat Regulations (1994).  Affects Schedule 5 and Annex II protected species.	Proposal does not comply with Structure and Local Plan policies for the protection of internationally and nationally important sites, nor with policies relating to Protected Species.	If, despite mitigation, it cannot be concluded that there will be no adverse effects on the integrity of the heathland and sand lizards, by law (under Regulation 48) planning permission cannot be granted, unless there are over-riding issues of public interest. Redesign of the proposal or relocation to another site may be necessary.  If consent is granted, compensation of losses may be required by the Secretary of State under Regulation 53, and secured via planning conditions and obligations. Also, impacts to sand lizards must be avoided and/or mitigated, requiring licences from the relevant statutory body.
<b>National</b>	E.g. Permanent loss of 3 ha of unimproved neutral grassland designated as a SSSI.	May conflict with the LPA's duty under Schedule 9 of the CROW Act (2000) paragraph 28G (2)	Conflicts with Structure and Local Plan policies for the protection of nationally important sites.	If, despite mitigation, adverse affects cannot be avoided, planning permission is likely to be refused; unless there are over-riding material planning issues (see PPG 9 Section 27).  If permission is granted, detailed measures (related in scale and kind) for impact mitigation, compensation and management (possibly offsite) should be secured through planning conditions and/or obligations.
<b>Regional/ county</b>	E.g. Permanent clearance of 0.5 ha of mature woodland designated as a SINCC.	May conflict with conditions for timber felling, licensed by Forest Authority.	Conflicts with Structure and Local Plan Policies protecting locally important sites.  May trigger No Net Loss policies requiring adequate mitigation and compensation.	If, despite mitigation, adverse affects cannot be avoided, permission is only likely be granted if there are over-riding material planning issues (see PPG 9 Section 27).  If permission is granted, detailed measures (related in scale and kind) for impact mitigation, compensation and management (possibly offsite) should be secured through planning conditions and/or obligations.
<b>Local</b>	E.g. Temporary reduction in breeding bird numbers in neighbourhood due to clearance of scrub, which will be allowed to then regenerate.	May conflict with Wildlife & Countryside Act 1981, Section 1 if implemented during the breeding season.	May trigger No Net Loss policies requiring adequate mitigation and compensation.	Measures to provide compensation of an equal or greater area of scrub should be secured through planning conditions or obligations. Long term management may be part of these measures. Clearance should be conditioned to avoid the bird nesting season.

Importance of resource or feature	Ecological Implications	Legal Implications	Policy Implications	Implications for Development Control (Detailed Design and Implementation)
<b>Positive Impacts</b>				
<b>International</b>	E.g. Creation of reedbed providing increased feeding and shelter in an area likely to attract and increase population of Bittern (Berne Convention (2), Bonn Convention (2), Birds Directive, Wildlife & Countryside Act 1981).	May comply with planning policies responding to the statutory duty on LPA imposed by Planning and Compensation Act (1990) <sup>lix</sup> Schedule 12	Makes significant contribution to national and local BAP targets to increase the extent of UK Priority Habitat.	<p>The detailed design, physical installation and aftercare of the proposed reedbed should be secured through planning conditions and obligations.</p> <p>Provision for long-term management and monitoring may also be secured through (possibly) conditions and/or (more likely) by planning obligations.</p> <p>Where appropriate, transfer of the land to an appropriate body may also be necessary and secured through a planning obligation.</p>
<b>National</b>	E.g. Provision of expanded feeding and shelter resources for dormice by planting native woodland adjacent to a large area of ancient woodland already containing dormice (Berne Convention (3), Habitats Directive (4), Wildlife & Countryside Act 1981(5, 6)).	Contributes to the implementation of Habitat Regulations (37) (1994).	Complies with Structure and Local Plan Policies seeking the management of “landscape features of major importance for wild flora and fauna”.	<p>Detailed measures and adequate resources for habitat restoration and for long-term management should be secured through planning conditions and/or obligations (monitoring should ideally be an integral part of long-term management practices).</p> <p>Where appropriate, transfer of the land to an appropriate body may also be necessary and secured through a planning obligation.</p>
<b>Regional</b>	E.g. Restoration and management of neglected wet grassland to provide improved opportunities for feeding and shelter for a small colony of Marsh Fritillary Butterflies (Wildlife & Countryside Act 1981 (5)).	May comply with planning policies responding to the statutory duty on LPAs imposed by Planning and Compensation Act (1990) Schedule 12	Makes a modest contribution to national and/or local BAP targets to increase the extent of a semi-natural habitat and in the long-term to provide possible additional habitat for Marsh Fritillaries.	<p>Detailed measures and adequate resources for habitat restoration and for long-term management should be secured through planning conditions and/or obligations (monitoring should ideally be an integral part of long-term management practices).</p> <p>Where appropriate, transfer of the land to an appropriate body may also be necessary and secured through a planning obligation.</p>
<b>Local</b>	E.g. Planting of new hedgerow to increase movement opportunities for mobile species.	May comply with planning policies responding to the statutory duty on LPAs imposed by Planning and Compensation Act (1990) Schedule 12	Complies with a Local Plan Policy intended to achieve landscaping and nature conservation benefits.	Planting design, installation and aftercare should be secured in detail through the use of a planning condition.

<sup>1</sup> Schedule 12 of the Planning and Compensation Act (1990) requires local planning authorities to include in their development plans, policies for “the conservation of the natural beauty and amenity of the land” and “the improvement of the physical environment”. Development Plans may therefore include policies to secure Net Gains for biodiversity (especially where it is possible to make a contribution to national and/or local BAP targets).

# Appendix 1

## Relationship between Department for Transport Biodiversity Impact Assessment Guidance and the IEEM Guidelines

(NB. This is currently under review by the Highways Authority, it is anticipated that this appendix will require changing for the final document.)

### 1.1 Background to TAG

The Government's Department for Transport (DfT) (previously under different names) has long been at the forefront of developing standard systems for EIA.

The latest guidance on assessing the effects of transport schemes is entitled Transport Assessment Guidance or TAG, which is available on the internet at [www.webtag.org.uk](http://www.webtag.org.uk). This advice supersedes the previous guidance published by the then Department of Environment Transport and the Regions, a document called Guidance on the Methodology for Multi-Modal Studies (GOMMMS). The TAG guidance is very similar to GOMMMS and, like it, was based on advice from English Nature.

The different topics in EIA are related to DfT policy and hence referred to as 'Objectives'. The guidance relevant to the present guidelines comes from the 'Biodiversity Sub-objective' of the Environment Sub-objective.' The guidance is intended to apply at various scales, from the assessment of strategic plans and multiple route options to the more detailed assessment of proposals. The DfT requires the guidance to be used for all major proposals (local transport proposals costing in excess of £5million), but is also set as best practice guidance for other proposals. The guidance states that it builds on the methods for assessing biodiversity and earth heritage that are set out in the Department's Design Manual for Roads and Bridges (which gave very little guidance on detailed impact assessment methods).

### 1.2 Valuation

Values of ecological receptors are set out in a table in TAG as produced below.

**TAG Table 1 Guidance on Determining the Nature Conservation Value of Features**

<b>Value</b>	<b>Criteria</b>	<b>Examples</b>
<i>Very High</i>	<i>High Importance and Rarity. International Scale and limited potential for substitution</i>	<i>Internationally designated sites.</i>
<i>High</i>	<i>High Importance and rarity, national scale, or regional scale with limited potential for substitution</i>	<i>Nationally designated sites. Regionally important sites with limited potential for 'substitution'</i>
<i>Medium</i>	<i>High or medium importance and rarity, local or regional scale and (limited) potential for substitution</i>	<i>Regionally important sites with potential for substitution. Locally designated sites.</i>
<i>Lower</i>	<i>Low or medium importance and rarity, local scale</i>	<i>Undesignated sites of some local biodiversity and earth heritage interest.</i>
<i>Negligible</i>	<i>Very low importance and rarity, local scale</i>	<i>Other sites with little or no local biodiversity and earth heritage interest.</i>

The particular emphasis on 'potential for substitution' (or capacity to be recreated) and whether this is 'limited' or not, shows the importance attributed by English Nature to this attribute and has likewise been emphasised in the present guidance, in consideration of reversibility. The word 'limited' in brackets is considered to be an error in the current web version TAG (it was not present in GOMMMS).

The value category of 'Medium' would include such site as County Wildlife Sites designated in local planning documents.

The focus of the examples in the TAG guidance Table 1 is on *sites* which gives little guidance in relation to the assessment of population of *species*. The present IEEM guidance is much more helpful in this regard. As an update from GOMMMS, TAG also provides another Table (Table 5, see below) on biodiversity and earth heritage value, which also includes reference to Biodiversity Action Plan Objectives. TAG emphasises that the Table is only a guide, once again and that features such as scale, Importance, trend and substitution possibilities all need to be considered in terms of valuing features.

**TAG Table 5: Guide to Biodiversity and Earth Heritage Value**

**International designations**

- Ramsar Sites (*Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971*)
- World Heritage Sites (*Convention for the Protection of World Cultural & Natural Heritage, 1972*)
- Biosphere Reserves (*UNESCO Man & The Biosphere Programme*)
- European Sites (*EC Habitats Directive 1992 & UK Habitats Regulations 1994*):
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)
- Sites of Community Importance (SCIs)
- Possible/Candidate SACs and potential SPAs
- Sites hosting habitats/species of (European) Community interest (*annexes 1 & 2, Habitats Directive, 1992*)
- Sites hosting significant species populations under the Bonn Convention (*Convention on the Conservation of Migratory Species of Wild Animals, 1979*)
- Sites hosting significant populations under the Berne Convention (*Convention on the Conservation of European Wildlife and Natural Habitats, 1979*)
- Biogenetic Reserves under the Council of Europe
- European Diploma Sites under the Council of Europe

**National designations**

- Sites of Special Scientific Interest (SSSIs; *Wildlife & Countryside Act 1981 as amended and National Parks and Access to the Countryside Act 1949*)
- Sites with Limestone Pavement Orders (*Wildlife & Countryside Act 1981*)
- Nature Conservation Review Sites (NCR)
- Geological Conservation Review (GCR) sites
- Marine Nature Reserves (MNRs; *Wildlife & Countryside Act 1981*)
- Areas of Special Protection for Birds (ASPs; *Wildlife & Countryside Act 1981*)
- Sites hosting Red Data Book species
- Sites hosting species not covered by the Berne Convention but in schedules 1, 5 and 8 of the *Wildlife and Countryside Act 1981*

**Regionally important and locally designated sites**

- Local Nature Reserves (LNRs; *National Parks and Access to the Countryside Act 1949*)
- Sites of Importance to Nature Conservation (SINCs)/County Wildlife Sites (CWSs)/other local designations
- Regionally Important Geological Sites (RIGs)
- Important 'inventory' sites (*e.g. ancient semi-natural woodland, and grassland, inventories*)
- Other sites (*not described above*) with Biodiversity Action Plan (BAP) priority habitats/species
- Other natural/semi-natural sites of significant biodiversity importance, *not referred to above* (*e.g. sites relevant to local Biodiversity Action Plan/Natural Area objectives*)

**Other sites with local conservation interest**

1. • Sites not in the above categories, but with some biodiversity or earth heritage interest.

environmental assessment (see e.g. DETR 1997<sup>ix</sup>). The present guidance suggests that compensation is considered separately from mitigation. TAG defines compensation as 'offsite proposals' in the same way as the present guidance.

**1.4 Characterisation of Impacts and Identifying Ecologically Significant Effects**

One valuable point in common with the present guidance is that TAG bases assessment on whether impacts on sites are significant or not in terms of the integrity concept. A further point of similarity is that in both the present guidelines, it is recommended that significance be considered regardless of the value of the feature being assessed.

There are though two notable differences in the definitions of terms and explanation of process between TAG and the present guidance as regards impact characterisation and the concept of significance as follows (see TAG Table 2, below):

1. TAG first uses the term magnitude to describe the whole impact characterisation process, relating this only to impacts on sites. The present guidelines assign the term Magnitude to a specific element of impact characterisation, that is the measured quantum of influence on the feature being considered (e.g. 3 dBA noise increase).
2. TAG has two categories of significant effects on sites. One is when integrity is affected and the other for effects that do not affect the integrity but are significant in terms of the conservation objectives. The present guidelines define a significant effect on a site **ONLY** as one that adversely affects its integrity. Effects only on conservation objectives of a site that would *not* lead to an effect on site integrity are not considered to be significant in terms of the site in the present guidance. *However, they may be in terms of the conservation status of habitats or species within the site and hence merit careful mitigation.*

## **1.5 Appraisal Categories and Consequences**

TAG (see TAG Table 3, below) then proceeds to considered judgements from Table 2 against nature conservation values (which the present guidelines propose the term ecological value) of feature to give rise to an overall '*Appraisal Category*'.

This is done in order, it is considered, to facilitate comparison of effects on features between disciplines for road route selection purposes. (It should be noted that in much of the EIA literature Appraisal Categories would be termed - to further confuse the semantics used - 'different levels of impact significance'.)

The reasons why the approach of assigning a shorthand to the combination of impact significance and value of feature is not recommended in the present guidance have been set out in the main text. **In short, it is proposed to describe an impact as either significant or insignificant, and, if significant, to add whether it is negative or positive, together with the value of the affected feature. For example, an impact might be described as significant, negative and the affected feature as of national value.**

**TAG Table 2: Criteria for Determining the Magnitude of Impact (in the present guidance this would be method to identify significant ecological impacts)**

<b>Magnitude</b> (As used in TAG this subsumes impact characterisation and determination of whether effect is ecologically significant or not)	<b>Criteria</b>	<b>Present Guidance</b>
<b>Major Negative</b>	The proposal (either on its own or with other proposals) may adversely affect the integrity of the site, in terms of 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 population levels of special interest.	This would equate to an ecologically significant impact on the site
<b>Intermediate Negative</b>	The site's integrity will not be adversely affected, but the effect on the site is likely to be significant in terms of its ecological objectives. If, in the light of full information, it cannot be clearly demonstrated that the proposal will not have an adverse effect on integrity, then the impact should be assessed as major negative.	These would not be significant ecological impacts on the site in question in the present guidance, but would be reflected as significant impacts on the conservation status a species or habitat in the site
<b>Minor Negative</b>	Neither of the above apply, but some minor negative impact is evident. (In the case of Natural 2000 sites a further appropriate assessment may be necessary if detailed plans are not yet available.)	Non-significant impact
<b>Neutral</b>	No observable impact in either direction	As present guidance
<b>Positive</b>	Impacts which provide a net gain for wildlife overall	As per present guidance, though it is recommended that the scale at which this enhancement applies needs major emphasis

**TAG Table 3: Estimating the Overall Appraisal Category**

<i>Magnitude of potential impact</i>	<i>Nature conservation value of sites damaged or improved</i>				
	<i>Very High</i>	<i>High</i>	<i>Medium</i>	<i>Lower</i>	<i>Negligible</i>
<i>Major Negative</i>	<i>Very Large Adverse</i>	<i>Very Large Adverse</i>	<i>Moderate Adverse</i>	<i>Slight Adverse</i>	<i>Neutral</i>
<i>Intermediate Negative</i>	<i>Large Adverse</i>	<i>Large Adverse</i>	<i>Moderate Adverse</i>	<i>Slight Adverse</i>	<i>Neutral</i>
<i>Minor Negative</i>	<i>Slight Adverse</i>	<i>Slight Adverse</i>	<i>Slight Adverse</i>	<i>Slight Adverse</i>	<i>Neutral</i>
<i>Neutral</i>	<i>Neutral</i>	<i>Neutral</i>	<i>Neutral</i>	<i>Neutral</i>	<i>Neutral</i>
<i>Positive</i>	<i>Large Beneficial</i>	<i>Large Beneficial</i>	<i>Moderate Beneficial</i>	<i>Slight Beneficial</i>	<i>Neutral</i>

- (A) *Options in the 'very large adverse' category are likely to be unacceptable on nature conservation grounds alone (even with compensation proposals)*
- (B) *There should be a strong presumption against options in the large adverse category, with more than 1:1 compensation (net gain within the Natural Area) for the very occasional cases where development is allowed as a last resort*
- (C) *Options in the moderate adverse category should include at least 1:1 compensation (no net loss)*
- (F) *Positive impacts should be considered to be of lower value if the gains are clearly evident but not significant in terms of the conservation objectives of the Natural Area. Positive impacts should be classed as moderate value if they deliver significant gains to the Biodiversity Action Plan objectives in the Natural Area, and of large value if they deliver positive gains of national or international importance within the Natural Area) if development is allowed.*

The Appraisals in TAG Table 3, goes further than merely providing a short-hand for significance of impacts in relation to 'value of receptors'. TAG attempts to encompass what the present guidance has termed 'consequences'. The explanatory notes attached to the Table explain this approach. The problem is, that the terms for Appraisal Categories used, reflect unexplained value judgements and gradings based on policy and law that are neither explicit nor comprehensive. At lower levels of receptor importance, the TAG approach risks misrepresenting the whole gamut of regional and local policy and guidance, which would have a bearing on the appropriate consequences of the impact (and hence Appraisal Category).

## Glossary

Impact

Effect

Abiotic

Not biotic, not of life. Part of the environment that is not biological; that is water, soil, climate, geology.

Assemblage

A group of species characteristically found in the same location due to the similarity of their habitat requirements.

Avoidance

Measures taken to avoid adverse impacts, such as locating the main development and its working areas and access routes away from areas of high ecological interest, fencing off sensitive areas during the construction period, or timing works to avoid sensitive periods. Also includes alternative and 'do nothing' options.

Baseline  
Conditions

The conditions that would pertain in the absence of the proposed action.

Biodiversity

The total range of variability among systems and organisms at the following levels of organisation: bioregional, landscape, ecosystem, habitat, communities, species, populations, individuals, genes and the structural and functional relationships within and between these different levels.

Buffer Zone

An area or zone that helps to protect a habitat from damage, disturbance or pollution. It is an area (human-made or natural) that is managed to protect the 'integrity' of that area.

Carrying  
Capacity

The maximum number of organisms or amount of biomass that can be supported in a given area.

Compensation

Measures taken to offset/compensate for residual adverse effects, which cannot be entirely mitigated. These usually take the form of replacing (or at least trying to) what will be lost e.g. the relocation of important grassland or heathland habitats from the development site to another area identified as suitable (using techniques such as soil or turf transfer), or the creation of new habitats.

Competent  
Authority

The authority which determines whether or not an application for a project can proceed.

Connectivity

A measure of how connected or spatially continuous a corridor, network, or matrix is. (The fewer the gaps the higher the connectivity.) Related to the structural connectivity concept; functional or behavioural connectivity refers to how connected an area is for a process, such as an animal moving through different types of landscape elements.

Enhancement

A genuine attempt to increase the value and importance of biodiversity interest. Usually applied to areas where there is already some existing interest that can be improved e.g. through improved management, with the result that there is a new benefit to biodiversity.

Fauna

A collective term for all kinds of animals.

Flora

A collective term for all kinds of plants.

Fragility

The inverse of ecosystem stability.

Fragmentation

The breaking up of a habitat, ecosystem, or land-use type into smaller parcels. Fragmentation results in the change in the physical environment within the parcels (e.g. in fluxes of radiation, water and nutrients) and in biogeographic changes (e.g. in isolation and connectivity) which have important consequences for biota.

Habitat

A place in which a particular plant or animal lives. Often used in the wider sense referring to major assemblages of plants and animals found together.

Integrity	The coherence of a site's ecological/geological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or levels of populations of the species for which it was designated.
Keystone Species	A species in a community which interacts with other species and upon which many other species depend. Also used to describe the effect of a change in one species on some characteristic (e.g. processes or functions) of its community or ecosystem. Keystone species have an impact that is out of proportion to their proportional abundance. A species on which several species, or the functioning of an ecosystem, may depend.
Landscape	A mosaic where a cluster of local ecosystems is repeated in similar form over a kilometres-wide area.
Mitigation	Measures taken to reduce adverse impacts e.g. modifications or additions to the design of the development, such as the creation of reed bed silt traps to prevent polluted water running directly into ecologically important watercourses. The preservation of 'wildlife corridors' between habitats which would be separated by a proposed development may reduce the possible effects on some fauna.
Natural Areas	Biogeographic regions in England as specified by English Nature.
Network	An interconnected system of corridors.
Niche	The 'space' or 'ecological role' occupied by a species and the resources used by a species. Conceptually the niche is multidimensional and each resource (food, time of feeding, etc.) and each abiotic factor (salinity, temperature, etc.) can be considered a dimension of the niche.
Net Gain	The point at which the quality and quantity of habitats or species improves compared to their original condition. i.e. improvements over and above those required for mitigation/compensation.
No Net Loss	The point at which habitat or biodiversity losses equal their gains, both quantitatively and qualitatively.
Patch	A relatively homogeneous non-linear area that differs from its surroundings.
Population	A collection of individuals (plants or animals), all of the same species and in a defined geographical area.
Rarity	A measure of relative abundance.
Receptor	Any ecological component affected by a particular action or stress.
Restoration	The re-establishment of a damaged or degraded system or habitat to a close approximation of its pre-degraded condition.
Scale	Spatial proportion, as the ratio on a map to actual length; also the level or degree of spatial resolution perceived or considered. (Fine scale refers to pattern in a small area, where the difference between map size and actual size is relatively low, whereas broad or coarse scale refers to a large area, where the difference is great).
Scoping	Determination of the scope of an EIA.
Screening	Determination of whether or not an EIA is necessary.
Semi-natural Vegetation	Vegetation which has been modified by humans but is still of significant nature conservation interest because it is composed of native plant species, is similar in structure to natural types and supports native animal communities.

Species	A group of organisms of the same kind which reproduce amongst themselves but are usually reproductively isolated from other groups of organisms.
<b>Succession</b>	<b>The process by which a series of plants colonise a substrate over time, such as a change from open water, through swamp and scrub to woodland.</b>

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