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Guidelines for Assessment of Ecological Impacts of National Roads Schemes

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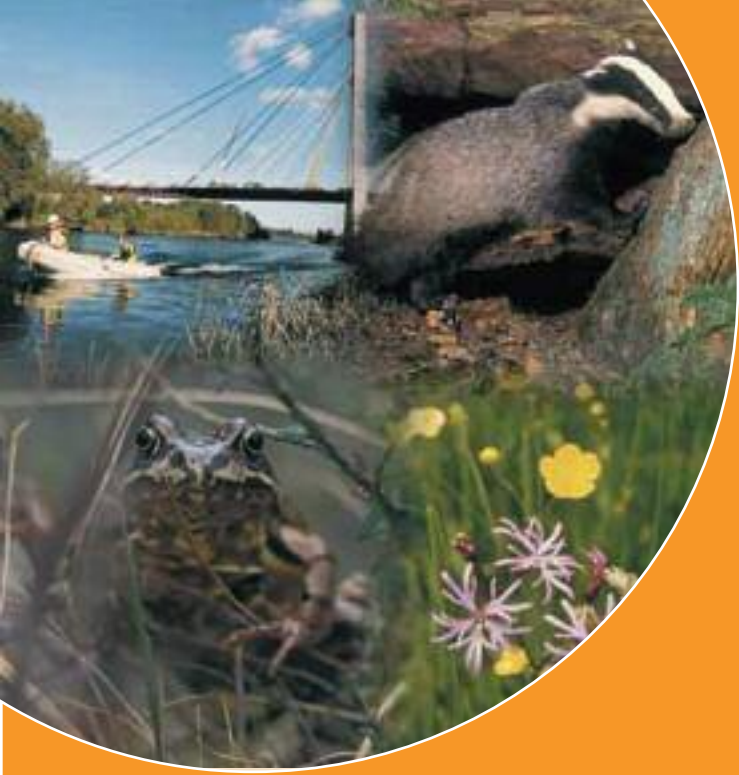
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This original document is part of a suite of documents published by the National Roads Authority (NRA) in the 2000s and early 2010s as part of its 'Four Stage Strategy – The Environmental Integration Model'. These documents were the NRA's *Environmental Assessment and Construction Guidelines* and *Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan*.

For further explanation on the 'Four Stage Strategy – The Environmental Integration Model,' refer to [TII Environmental Strategy](#) Section 4: *Delivery Framework*.

In some cases, these documents have been replaced by Transport Infrastructure Ireland (TII) with Standards and/or Technical Documents on TII's Publications system. In such cases, the original NRA environmental assessment or construction guideline is deemed to be withdrawn but is made available on TII's Publications system for historical reference (and, potentially, as a source reference in TII Standard and/or Technical Documents, where indicated).

Where original NRA *Environmental Assessment and Construction Guidelines* have not yet been replaced by newer TII Standards and/or Technical Documents, these are made available as Technical Documents, and they should continue to be consulted in the planning and construction of national road projects. However, given the passage of time, they should be read with a strong element of caution. These documents should be read in light of potentially significant changes in best practice, regulation, policy, etc., since original publication.



National Roads Authority

Guidelines for Assessment of Ecological Impacts of National Roads Schemes

Guidelines for Assessment of Ecological Impacts of National Road Schemes

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REVISION

This document was revised in 2009 to align it with changes in legislative, best practice and policy requirements with regard to Ecological Impact Assessment arising since the previous revision in March, 2006.

With regard to best practice and policy requirements the revisions take account of the procedure for the ecological component of Environmental Impact Assessment laid down in the Institute of Ecology and Environmental Management's (IEEM) (2006) *Guidelines for Ecological Impact Assessment in the United Kingdom*.

These Guidelines have also been revised to synchronise them with the supplementary guidance document: the NRA's *Ecological Surveying Techniques for Protected Flora & Fauna during the Planning of National Road Schemes* published in 2008.

With regard to legislative requirements, the Guidelines provide more detailed information on certain relevant environmental law provisions, including: Articles 25 and 30/33 of the Habitats Regulations, 1997; Articles 6(3) and 6(4) of the Habitats Directive; and the Environmental Liability Directive.

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The background of the page is a photograph of a road with white dashed lane markings. A metal guardrail runs along the right side of the road. In the distance, there is a large, light-colored building, possibly a school or a public building, set against a hazy sky. A large, semi-transparent orange circle is overlaid on the left side of the image, partially obscuring the road and the building.

CHAPTER 1
INTRODUCTION

Guidelines for Assessment of Ecological Impacts
of National Road Schemes

1 INTRODUCTION

1.1 Background and rationale

The procedures followed by the National Roads Authority (NRA) and local authorities in the planning, design and implementation of road schemes are specified in the Roads Act, 1993, as amended, and in the NRA's (2000) *National Roads Project Management Guidelines* ('NRPMG'). A key objective of the NRPMG is to ensure the efficient delivery of the national roads programme in a manner which minimises adverse human and environmental effects while maximising the benefits of the new road infrastructure and respecting all applicable legislation.

The aim of this document (hereafter referred to as the 'Ecology Guidelines') is to provide guidance on the assessment of impacts on the natural environment during the planning and design of national road schemes. It elaborates on the references to ecology (habitats, flora and fauna) contained in the NRPMG, which provides the overall framework for managing the planning and design of national road schemes. In particular, the guidelines expand on the ecological work to be undertaken at the Constraints Study (CS) phase, Route Corridor Selection (RCS) phase and the subsequent preparation of the Environmental Impact Statement (EIS).

National road schemes are large developments that have potential impacts on the natural environment (habitats, flora and fauna, including fisheries) along their entire length. Concomitant with the need for new and safer roads, there has been a growing awareness of the need to conserve and protect Ireland's natural heritage and biodiversity. One of the objectives of the planning stages of road schemes is to avoid or reduce the negative impacts of the final route on the natural environment. This is achieved in part through the Environmental Impact Assessment (EIA) process that, for road schemes, is carried out in a series of project management phases, including CS, RCS and EIS (See Section 1.3).

When impacts on the natural environment are unavoidable, a variety of measures can be introduced to reduce, remedy or off-set these impacts. Principles and general guidance with regard to mitigation, compensation and enhancement measures are presented in this document. More detailed guidance with regard to individual habitats and species is available in the relevant supplementary guidance documents set out in Section 1.6.

The National Biodiversity Plan (Department of Arts, Heritage, Gaeltacht and the Islands, 2002) includes a requirement for all statutory agencies to prepare "guides to best practice" for any activities that have an impact on biodiversity conservation. These guidelines form part of the NRA response to the National Biodiversity Plan.

1.2 Environmental Impact Assessment

General guidance on the scope and detail of environmental impact assessment is available in *Guidelines on the information to be contained in Environmental Impact Statements* (Environmental Protection Agency, 2002), and the NRA's (2008a) *Environmental Impact Assessment of National Road Schemes - A Practical Guide*, helps to interpret this guidance in the context of road projects. The 'Ecology Guidelines' adopt the principles presented in these

guidance documents, whilst integrating the approach to impact assessment detailed in the Institute of Ecology and Environmental Management's (2006) *Guidelines for Ecological Impact Assessment*.

1.3 Outline of project management phases

In the *National Roads Project Management Guidelines* (NRPMG) (NRA, 2000), planning for road schemes in general is divided into four phases. Phase 1 involves the overall planning of the scheme, including defining the road need, obtaining NRA formal approval to carry out the further phases, appointing consultants, if programmed, and setting out to incorporate the need in the local development plan once approval for planning has been obtained from the NRA. Phases 2 and 3, the Constraints and RCS studies, are primarily concerned with the avoidance of impacts (i.e., where feasible) and the consideration of alternatives, two fundamental components of the EIA process. Phase 4 includes preparing the EIS for the preferred route. As the scheme progresses through the stages (from 2-4), the area of study generally decreases, or becomes more focused, while the level of detail in the study increases. The natural environment section of the CS phase involves a desk study only, while the RCS phase also includes fieldwork. The preparation of the natural environment section of the EIS requires an in-depth study of the preferred route corridor, including both desk study and field study. This is summarised graphically in Figure 1.

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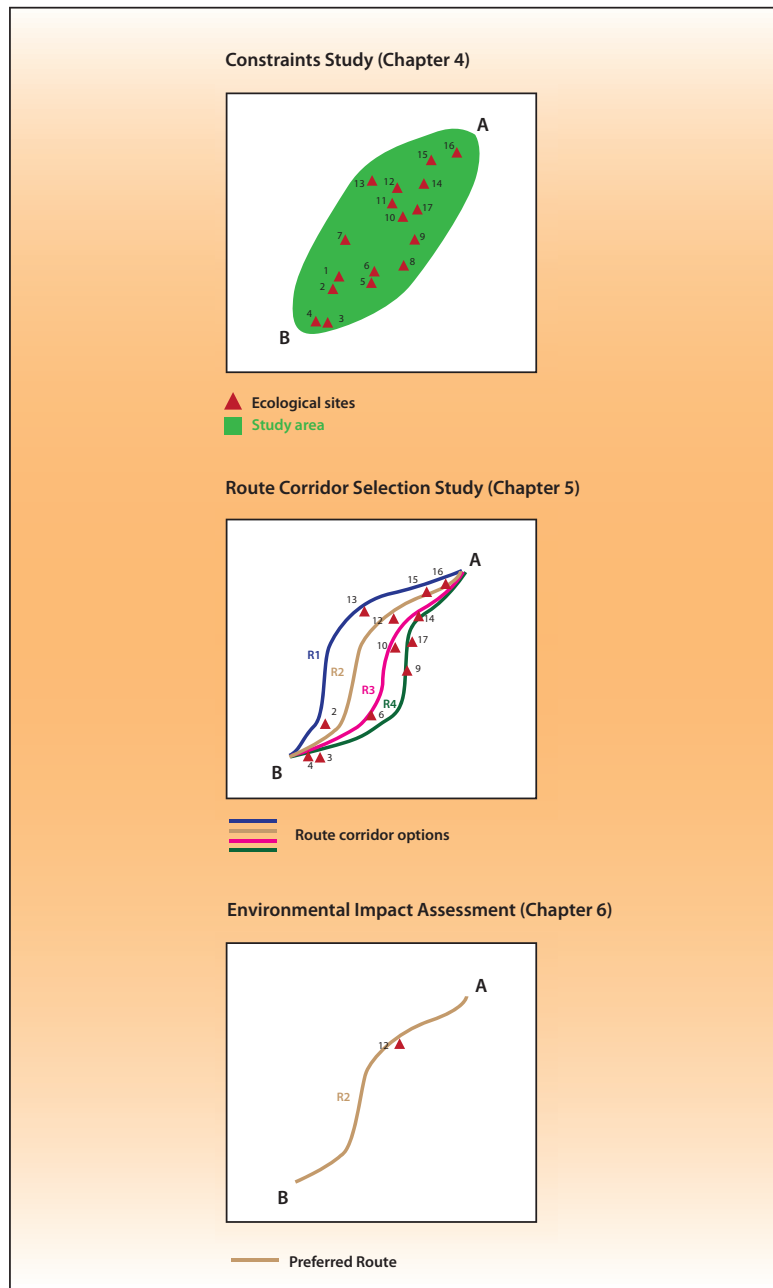


Figure 1: The phases of planning for ecological assessment of national road schemes showing a typical study area and route corridors

1.4 Consultees

Consultees in the EIA process include authorities or agencies with statutory responsibility for the protection of the natural environment, including the collection and provision of data and information, and those to whom ecological aspects of the proposed development may be referred for comment. For the natural environment, the main statutory bodies are the National Parks and Wildlife section of the Department of Environment, Heritage and Local Government, and the

Central and Regional Fisheries Boards¹ (Department of Communications, Energy and Natural Resources). These agencies have special responsibilities to respond to the procedural and pragmatic demands of EIA. They should be approached initially at an early stage in the planning process to inform them of the development proposals, to seek data or information about the existence or significance of ecological or natural resources and, later, to seek evaluations of the likely acceptability of residual impacts or mitigation proposals. The EPA and the Heritage Council may also be consulted on certain issues affecting the natural environment.

Of the voluntary groups, only An Taisce is prescribed under planning legislation to have special rights as a statutory consultee, while it and other Non-Governmental Organisations (NGOs) have responsibilities that can interact with the EIA process in a number of ways. Early, open and constructive engagement has frequently proven to be beneficial to both the protection of the environment and to the quality of development projects (EPA, 2002). The main NGOs with an interest in the natural environment include An Taisce, BirdWatch Ireland, the Irish Wildlife Trust, the Irish Peatland Conservation Council, CoastWatch Ireland and Bat Conservation Ireland. These organisations, and others, can provide an informed and experienced focus and, where appropriate, their views should be sought at an early stage. They can help to identify additional sources of data/information and can ensure that potential issues, which might lead to costly work at a later stage, are not overlooked.

1.5 REQUIREMENTS OF AN ECOLOGIST

The survey and assessment of the natural environment for the purpose of these guidelines requires expertise, experience, independence and objectivity. The ecologist should hold appropriate academic qualifications, have relevant experience and be accredited by a recognised professional body. The EPA (2002) provides guidance on the requirements of environmental specialists and this includes the need for qualified ecologists to carry out the environmental assessment of road schemes. In summary, the ecologist should be capable of characterising the existing environment and evaluating its importance. The ecologist must also be able to predict how the proposed road scheme will interact with the receiving environment. Where mitigation measures are required, the ecologist must be capable of assisting in designing such measures. The ecologist should have a knowledge of the relevant legislation and standards that apply to the subject; be familiar with the relevant standards and criteria for evaluation and classification of significance of impacts; be able to interpret the specialised documentation of the construction sector, in so far as it is relevant to the natural environment; and be able to clearly and comprehensively present the findings. One individual ecologist is unlikely to have all the expertise necessary and various specialists may be required to carry out detailed surveys of fauna (e.g. bats, birds or invertebrates), flora (e.g. rare plants), vegetation communities, or of marine or freshwater habitats.

1.6 SCOPE AND STRUCTURE OF THE 'ECOLOGY GUIDELINES' AND SUPPLEMENTARY DOCUMENTS

Chapter 2 of this document presents a general overview of ecological resources in Ireland, their conservation status, and the legal and policy framework for their protection.

Chapter 3 provides guidance on ecological impact assessment procedures.

¹ The Regional Fisheries Boards have a statutory duty, under the Fisheries (Consolidation) Act, 1959, to conserve, protect, develop, manage and promote inland fisheries, including the conservation of fish, other species, habitats and the biodiversity of inland water ecosystems

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Chapter 4, Chapter 5 and Chapter 6 set out the scope and detail of ecological surveys and impact assessments associated with each of the project management phases: CS, RCS study and EIS.

Appendix I identifies designated conservation areas in the Republic of Ireland.

Appendix II provides advice in relation to Appropriate Assessment (for those instances where road projects could affect European sites).

Appendix III provides advice on derogation licensing procedures in relation to protected flora and fauna.

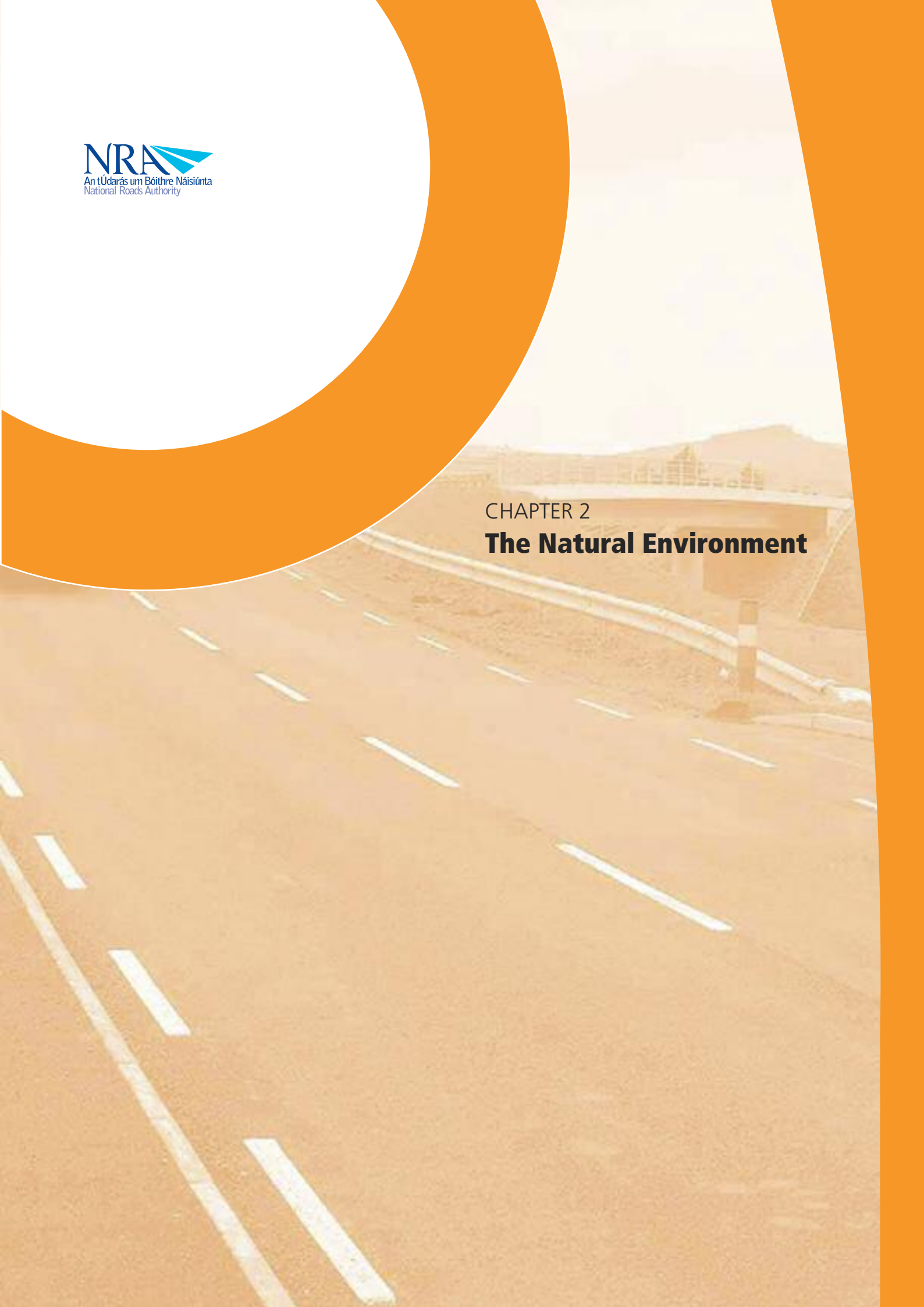
Appendix IV discusses the provisions of the Environmental Liability Directive.

Appendix V deals with the issue of local authority works affecting Nature Reserves, Nature Refuges and Natural Heritage Areas (NHAs).

Guidance on ecological surveys is presented in a supplementary document: *Ecological Surveying Techniques for Protected Flora & Fauna during the Planning of National Road Schemes* (NRA, 2008b); hereafter referred to as the 'Survey Guidelines'. The appendices to this document present a suggested list of desk study contacts and key consultees; details of optimum seasonal survey timings; and legal, policy and conservation status of sites, habitats and species in Ireland. Further species and group-specific guidance on surveys and mitigation is presented in: *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes* (NRA, 2006a); *Guidelines for the Treatment of Bats During the Construction of National Road Schemes* (NRA, 2005a); *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (NRA, 2006b); and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (NRA, 2005b). Two further documents contain general guidance relevant to the issues addressed by the 'Ecology Guidelines', particularly in relation to mitigation measures: *A Guide to Landscape Treatments for the National Road Schemes in Ireland* (NRA, 2006c) and *Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes* (NRA, 2005c). The NRA's (2006d) *Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes* also contain relevant information.

CHAPTER 2

The Natural Environment



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CHAPTER 2 THE NATURAL ENVIRONMENT

2.1 Introduction

Ecology is the study of the relationships between living organisms and between them and their physical environment, their energy flows and their interactions with their surroundings (EPA, 2002). Thus, the natural environment includes ecosystems, habitats and species of terrestrial, freshwater and marine environments, or the full range of biological diversity (biodiversity for short).

The framework for the identification and protection of these ecological resources is set out below.

2.2 Designated conservation areas

The national network of designated areas for nature conservation covers approximately 14% of the national territory of Ireland and includes the following site designations: Natural Heritage Area (NHA), Special Area of Conservation (SAC), Special Protection Area (SPA), National Park, Nature Reserve, Refuge for Fauna, Refuge for Flora, Wildfowl Sanctuary, Ramsar Site, Biogenetic Reserve and UNESCO Biosphere Reserve. Sites are designated by the Department of Environment, Heritage and Local Government under national legislation or EU directives and other international conventions, and are considered to be of prime importance for the conservation of valuable components of the natural environment (biodiversity, ecosystems, habitats and species). Many sites have multiple designations and the process of site selection and designation is ongoing. Designated areas fall into a hierarchy in terms of their importance for conservation and priority for protection, as outlined in Appendix I. The degree of protection afforded designated areas varies considerably but most are either legally protected, protected through ownership by the State, or their existence is recognised for most administrative purposes.

For the protection of fisheries, Ireland also supports a network of Salmonid Waters designated by the Department of Environment, Heritage and Local Government under the EU Freshwater Fish Directive (78/659/EEC).² These rivers, and a number of other non-designated waters, are important for salmonids (salmon and trout) and, accordingly, their water quality and fish habitat must be maintained.

The EU Water Framework Directive (2000/60/EC) establishes a framework for action to achieve a sustainable water policy. The Directive covers all community waters, including surface waters (e.g. rivers and lakes), transitional waters, coastal waters and groundwaters. A primary objective of the Directive is to ensure that no deterioration occurs in relation to the existing status of waters and that at least “good status” (based on ecological and chemical ‘status’) is achieved for all waters by 2015. Scannell (2006, p. 290) indicates that ‘*Under Art.6(1), Ireland must have ensured that registers of areas designated as requiring special protection under Community legislation and for the protection of surface or groundwater or habitats and species depending on water were established for each river basin district by December 22, 2004.*’ For more information on these issues readers are directed to *Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (National Roads Authority, 2008c).

² Council Directive of 18 July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life (78/659/EEC), implemented in Ireland under the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 84 of 1988)

Macken (2007, p. 7/23) states that under Part XIII of the Planning and Development Act, 2000, planning authorities have the power to designate 'areas of special amenity'. These are designated by reason of an area's outstanding natural beauty or its special recreational value and having regard to any benefits for natural conservation.

Planning authorities may also make an order for the preservation of 'any tree, group of trees or woodlands' if they consider that it is expedient in the interest of amenity or the environment to make such an order, for stated reasons (Macken, 2007, p. 7/25). The orders may prohibit, subject to any conditions or exemptions for which provision is made in the order, the cutting down, topping, lopping, or willful destruction of trees.

Planning authorities will often designate conservation areas under their County Development Plans. For example, Westmeath County Council's *Draft County Development Plan 2008-2014* (WCC, 2008) proposes the designation of a number of 'areas of high amenity.' The draft objectives for these areas are: (1) To conserve the natural resources of each area in terms of landscape character, scenic quality, habitat value and water quality; (2) To provide for the use of each area for recreational purposes by local communities; and (3) To provide for the development of sustainable and natural resource tourism. A number of other County Development Plans contain similar designations with similar objectives.

2.3 Non-designated areas

The designated area network in Ireland is neither exhaustive nor static and there are many areas of semi-natural habitat outside these sites that are important for wildlife. These areas must be taken into consideration if the ecological resources of the wider countryside are to be maintained and protected. Section 3.3 provides guidance on the valuation of non-designated ecological resources.

2.4 Rare and protected species

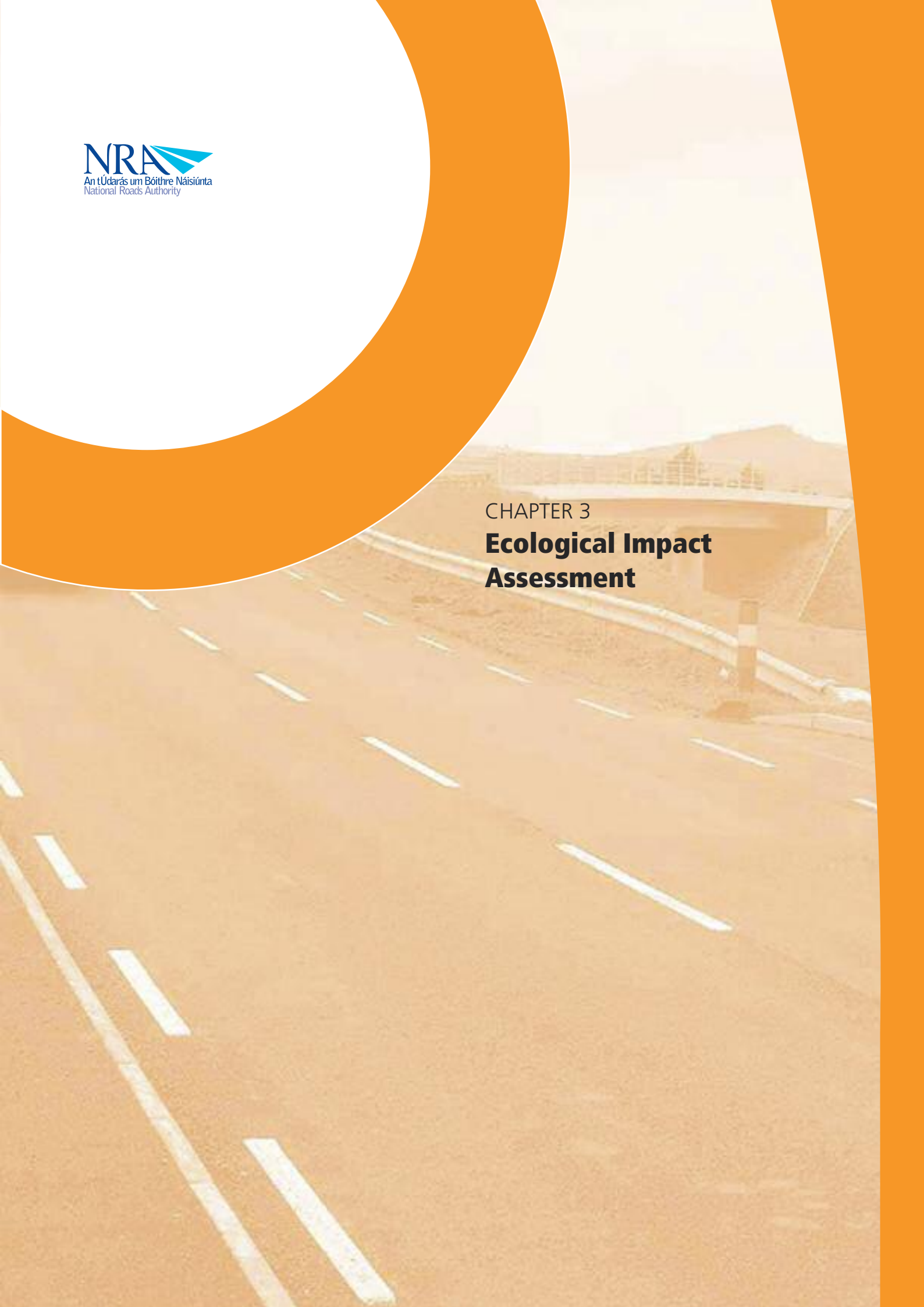
Special consideration must be given in the planning of national road projects to protected species. Several species of flora and fauna are afforded protection under national, European and international law. At a national level, species are protected under, *inter alia*, the Wildlife Acts. At a European level, species are protected under, *inter alia*, the Birds Directive (Council Directive 79/409/EEC) and Habitats Directive (Council Directive 92/43/EEC), which are transposed into national law by various measures including the European Communities (Natural Habitats) Regulations, 1997-2005, and the European Communities (Conservation of Wild Birds) Regulations, 1985. In many cases a derogation licence will be required to remove or disturb these legally protected species or their habitats (see Appendix III).

Additionally, special consideration must be given in the planning of national road projects to species of conservation concern. The conservation status of a number of species is reviewed in the Red Data Books (Curtis & McGough, 1988, Stewart & Church, 1992, Whilde, 1993) where they are listed as rare, endangered, threatened or indeterminate, although these reviews are now somewhat out-of-date. More recent data on birds of conservation concern in Ireland is given in Lynas *et al* (2007). The Red Data Book (Vascular Plants) is currently being updated by Curtis *et*

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al. The conservation status of EU protected habitats and species is presented in *The Status of EU Protected Habitats and Species in Ireland* (DoEHLG, 2008a).

Guidance is presented in Section 3.3 on how to value rare and protected species in the context of EIAs for road projects. Information on the status of protected species and species of conservation concern is also collated and summarised in Appendix III of the ‘Survey Guidelines’.



CHAPTER 3
**Ecological Impact
Assessment**

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CHAPTER 3 ECOLOGICAL IMPACT ASSESSMENT

3.1 Introduction

Ecological impact assessment (EcIA) is a tool to identify, estimate and evaluate the consequences of proposed actions on the natural environment. It has been defined as “*the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components*” (Treweek, 1999).

In the context of this document ‘ecological resources’ relate to sites, habitats, features, assemblages, species or individuals that occur in the vicinity of a project and upon which impacts are possible. The term ‘ecological receptors’ is used when impacts upon them are likely. The term ‘resources/receptors of ecological value’ is intended to refer to those that are judged to be of importance at a particular geographic scale (e.g. at an international, national, county scale – this is explained further in Section 3.3).

A range of activities tend to be associated with the construction, improvement, operation, maintenance and decommissioning of roads. Each of these will potentially give rise to changes in the natural environment that could have impacts upon resources of ecological value. It is possible to identify several broad impact types that are most often associated with road projects: habitat loss, habitat degradation, habitat fragmentation, disturbance, construction- and road traffic- related mortality. There are also opportunities throughout the different phases of national road development projects to generate positive impacts on ecological resources through habitat enhancement.

The approach to EcIA set out in the subsequent sections applies to each of the project management phases: CS, RCS and EIS, although the evaluation of ecological resources and investigation of potential impacts will be undertaken in increasing detail as the road project is refined. The principles and assessment methodologies are therefore set out in the remaining parts of Chapter 3, with guidance on how these should be applied within each project management phase given as appropriate in Chapter 4, Chapter 5 and Chapter 6.

3.2 Scoping for Ecological Impact Assessment

Scoping is the process by which the necessary information to be gathered during the environmental assessment of a road project is refined, ensuring that there is an efficient and economic use of resources, while gathering adequate information to fully inform the assessment of impacts upon the key ecological receptors.

It is an iterative procedure which should take place throughout each phase of the project management process, with the information gathered at each phase of project development being used to inform the requirements for survey and assessment at the next stage. As more information is collected, this should be used to amend the scope of the RCS study and, subsequently the EIS, as appropriate.

Effective consultation is also key within the scoping process. Engagement of stakeholders and statutory consultees helps to ensure that the key ecological issues are being adequately addressed and that the methodologies for data collection and impact assessment are appropriate. It is

important, therefore, that a framework for consultation is set out at an early stage of a national road development project and that discussions and reviews continue, as appropriate, throughout the project management phases.

3.2.1 Understanding a road project and predicting its likely impacts

Predicting the likely impacts of a road project requires a thorough understanding of the construction activities and project programme. It is necessary to review the various activities associated with road construction and operation that are likely to cause biophysical changes that would result in ecological impacts. As part of this, information will need to be obtained on the spatial extent, timing, frequency and duration of these activities. It is necessary also to consider activities throughout the lifetime of the project.

For a road project, the key construction activities that may result in ecological impacts are:

- ⊙ vegetation and soil stripping;
- ⊙ other earthworks;
- ⊙ blasting and other excavations causing high levels of noise and vibration;
- ⊙ construction of structures and hard surfaces;
- ⊙ construction of barriers to wildlife movements such as berms, fences, median barriers;
- ⊙ construction site drainage;
- ⊙ demolition operations;
- ⊙ air pollution and dust deposition;
- ⊙ work associated with site compounds and storage areas;
- ⊙ temporary access routes;
- ⊙ lighting;
- ⊙ movement of plant and vehicles;
- ⊙ disturbance associated with the presence of construction staff;
- ⊙ new planting; and
- ⊙ environmental incidents and accidents.

Key operational-phase activities include:

- ⊙ traffic use;
- ⊙ operational drainage;
- ⊙ lighting;

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- ⦿ management of new planting; and
- ⦿ maintenance operations.

3.2.2 Establishing a 'zone of influence' for the project

It is important to establish, on a project-by-project and phase-by-phase basis, the receiving environment for the activities associated with the project and the biophysical changes that are likely to result. It is important for each of these activities and the associated changes, to estimate an 'effect area' over which the change is likely to occur. Wherever possible, it is helpful to map the location of the various activities and their 'effect areas,' for example, zones within which noise is expected to increase, or the anticipated locations of drainage outfalls and the receiving watercourses. It is then necessary to identify, as part of this mapping exercise, the ecological areas and features (i.e. the ecological resources/receptors) likely to be affected by the biophysical changes caused by the project, however remote from the route. From this it will be possible to establish a 'zone of influence' for the project that encompasses all of its potential impacts. The 'zone of influence' should be reviewed as the project develops, through each of the project management phases.

3.2.3 Identifying the ecological 'resources' and requirements for detailed assessment

Ecological resources within the 'zone of influence' should be identified initially by desk studies and consultations and then by limited site inspections and walkover surveys, as appropriate. Guidance on when to undertake these investigations during the different project management phases is set out in Chapter 4, Chapter 5 and Chapter 6. As part of the desk studies, it is also important to collate contextual information wherever possible, to provide a background for subsequent elements of the assessment process. For example, in order to value a particular ecological resource within an appropriate geographic frame of reference (as explained in Section 3.3), it may be necessary to review the distribution and abundance of that resource on a national, county or local basis.

Whether further surveys then need to be undertaken, and the extent of these, will depend upon whether designated sites or protected species (or other sites, species or assemblages of ecological value) are likely to be affected significantly by any aspect of the project in question. The aim of the procedure should be to focus the assessment only on the likely significant impacts of the project (guidance on determining significance is presented in Section 3.4.4).

In making this decision, it is important to consider both direct and indirect impacts that could arise from the various project activities and their associated biophysical changes. For example, depending upon its location, the direct impact of vegetation clearance and earthworks on a site might be the loss of an area of valuable woodland habitat that supports a population of protected plants. The indirect impacts associated with this activity might be less obvious. This loss of habitat may, for example, change the dynamics or viability of a population of a protected animal species which forages within it, perhaps only on a seasonal basis. It might also, for example, have effects on the local hydrology that could affect plant species composition in adjacent areas. In addition, the loss of sheltering trees could increase the likelihood of windthrow in the future, potentially affecting a different group of protected species.

This part of the process culminates in the selection of those ‘key ecological receptors’ for which detailed assessment is required and the design of any further surveys that may be necessary to underpin this assessment. Further advice on the scope, detail, techniques and boundaries of ecological surveys is presented in the ‘Survey Guidelines’.

Whilst the EcIA process should focus only on likely significant impacts, *any* effects on a European site may need to be the subject of further investigations and actions; guidance on dealing with European sites is presented in Appendix II and, as appropriate, in Chapter 4, Chapter 5 and Chapter 6.

3.3 Valuing ecological resources

3.3.1 Geographic context for determining value

The following geographic frame of reference should be used when determining value:

- ⊙ International importance
- ⊙ National importance
- ⊙ County importance (or vice-county in the case of plant or insect species)³
- ⊙ Local importance (higher value)
- ⊙ Local importance (lower value)

The collection of adequate contextual information is crucial in determining the value of ecological resources at the lower end of the geographic scale. For example, when dealing with locally important resources, it is often not possible to rely on or refer to designated sites or equivalent criteria. So, to value a site, area of habitat, or species population in a meaningful way, it is necessary to have some understanding of the distribution and abundance of that resource on a local and county basis.

Table 1 provides Examples of valuation at different geographical scales. Examples of the valuation and selection of ecological receptors are provided in Table 2. It should be noted that such examples are indicative and that all ecological resources should be valued and selected by competent experts having regard to the guidance provided in Section 3.3.

³ For further information on the vice-county system in Ireland see:
<http://www.botanicgardens.ie/herb/census/webbvcs.htm>
<http://www.mothsireland.com/vcmap.htm>

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Ecological valuation: Examples

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.⁴
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level)⁵ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).⁶

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level)⁷ of the following:
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing 'viable areas'⁸ of the habitat types listed in Annex I of the Habitats Directive.

⁴ See Articles 3 and 10 of the Habitats Directive.

⁵ It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁶ Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

⁷ It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁸ A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

County Importance:

- Area of Special Amenity.⁹
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)¹⁰ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP,¹¹ if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)¹² of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

Table 1: *Examples of valuation at different geographical scales*

⁹ It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

¹⁰ It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

¹¹ BAP: Biodiversity Action Plan

¹² It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

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Ecological receptors subject to impacts associated with a new road scheme	Summary descriptions of the ecological receptors	Value of the ecological receptors	Selection as key ecological receptors
Hedgerow network (managed by regular cutting to a height of approximately 1.5m)	The hedgerows comprise mainly hawthorn (<i>Crataegus monogyna</i>), with ash (<i>Fraxinus excelsior</i>) and occasional sycamore (<i>Acer pseudoplatanus</i>). Dog-rose (<i>Rosa canina</i>) and ivy (<i>Hedera helix</i>) are common and frequently grow extensively up into the canopy, along with brambles (<i>Rubus fruticosus</i> Agg.). The ground flora is relatively species-poor and includes cow parsley (<i>Anthriscus sylvestris</i>), hart's tongue-fern (<i>Phyllitis scolopendrium</i>), ivy and herb-robert (<i>Geranium robertianum</i>).	These hedgerows are not particularly species-rich and are of limited intrinsic ecological value. They also do not link other features of particular ecological importance and, thus, the local hedgerow network should be valued as of Local Importance (lower value).	As set out in Section 3.4.1, in the context of national road projects ecological resources of below Local Importance (Higher Value) do not represent 'key ecological receptors' for which detailed assessment is required.
Two fields of species-poor damp grassland (each 0.5ha in size)	This area of grassland is subject to periodic flooding, is grazed irregularly and is dominated by rushes (<i>Juncus spp.</i>). Meadow-grasses (<i>Poa spp.</i>) dominate the grass sward, with yorkshire-fog (<i>Holcus lanatus</i>) also present. The fields support a low diversity of common herb species. A limited assemblage of invertebrates was noted during the walkover surveys and no other records of animal or plant species exist for this area.	This small area of grassland is likely to be of some local importance for wildlife but lacks the diversity and other characteristics of a more valuable site and should therefore be valued as of Local Importance (lower value).	As set out in Section 3.4.1, in the context of national road projects ecological resources of below Local Importance (Higher Value) do not represent 'key ecological receptors' for which detailed assessment is required.
Relict demesne woodland approximately 40 Ha in size with mixed deciduous/coniferous trees, an associated stream, and supporting rare/protected species.	This woodland contains a mix of native and non-native tree species including oak (<i>Quercus sp.</i>), ash, sycamore, beech (<i>Fagus sylvatica</i>), hazel (<i>Corylus avellana</i>) and yew (<i>Taxus baccata</i>). The ground flora is dominated by ivy with wood speedwell (<i>Veronica montana</i>), wood avens (<i>Geum urbanum</i>), dog-violet (<i>Viola riviniana</i>), wild angelica (<i>Angelica sylvestris</i>) and ramsons (<i>Allium ursinum</i>) also present. A moderately polluted (Q-value 3) stream, approximately 1m wide and 30cm deep runs through the woodland. Hairy St. John's wort (<i>Hypericum hirsutum</i>), a species legally protected under the Flora Protection Order, 1999, and green figwort (<i>Scrophularia umbrosa</i>) (listed in the Irish Red Data Book 1: Vascular Plants), have both been recorded near the stream in the recent past. There is a resident population of red squirrel present within the woodland and a 'main' badger sett has been found on one of the woodland boundaries. These species are protected under the Wildlife (Amendment) Act, 2000.	The site does not fulfill the relevant criteria for designation as a site of National Importance, nor is it likely to support protected species in nationally-important numbers. However, on the basis of the woodland's size and quality, the population of red squirrels is likely to be of County Importance in terms of its size. In addition, this represents a substantial area of semi-natural habitat with high intrinsic biodiversity. It also supports rare/declining species. On this basis, it should be valued as of County Importance.	As this site has been identified as being of County Importance, and a significant impact upon it is possible, it should be selected as a 'key ecological receptor' and as such requires detailed assessment.

Table 2: Examples of the valuation and selection of ecological receptors

3.3.2 Designated sites and features

In the case of designated sites or features, it is appropriate to recognise the level of ecological value accorded by that designation and value the site or feature accordingly within the subsequent assessment; the reasons for the designation then need to be taken fully into account within the impact assessment process. In addition, sites for which the process of designation has commenced should be valued equivalently. In the event that surveys reveal that designated sites no longer meet their criteria for designation, the potential for them to be re-established should be assessed and their current value interpreted in consultation with the relevant designating authority.

3.3.3 Un-designated sites and features that meet the relevant criteria for designation

As identified in Chapter 2, the network of site designation in Ireland is not exhaustive and it is important that the valuation process does not overly rely on existing site designation. Surveys may reveal sites and features that appear to meet the criteria for designation at a particular level. In this case, the resources should be valued accordingly and their importance confirmed with DoEHLG/NPWS and/or the potential designating authority.

3.3.4 Other resources of nature conservation value

Where areas of a particular habitat do not obviously meet criteria for selection as a designated site, or where it is appropriate to value an assemblage, species or population, it is important to consider the features that tend to characterise valuable ecological resources.

These include:

- ⊙ Species that are rare at a particular geographic scale, and the habitats or features upon which they depend;
- ⊙ species undergoing substantial declines in abundance and distribution;
- ⊙ endemic species;
- ⊙ species on the edge of their natural range or distribution, particularly where this is contracting;
- ⊙ large populations of uncommon species;
- ⊙ species-rich assemblages;
- ⊙ features exhibiting a high degree of habitat diversity, structural diversity, connectivity and/or valuable juxtapositions of otherwise less intrinsically valuable habitats, that create conditions favourable for rare or protected species.

Wherever possible, values should be assigned to ecological resources on the basis of their known (or perceived) rarity, status and distribution, and hence collating contextual information for the resource at different geographic 'levels' is particularly relevant. In many cases it is appropriate to assign a value to assemblages of species, and these can be of greater value than their constituent parts.

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3.3.5 Other considerations

For sites, features, habitats and populations that are currently below favourable conservation status, their potential to be restored and the potential value they could reasonably attain should be taken into account, and described, in the valuation process. In addition, some features that are of limited intrinsic ecological value may perform important ecological functions for adjacent designated sites (e.g. buffer zones). This should also be taken into account, and explained, in the valuation process.

3.3.6 Other attributes of ecological resources

People derive benefits from ecological resources in a variety of ways. Some elements of social value are likely to have formed part of the designation criteria for sites identified as important at a county level. For other, non designated sites, it is also appropriate to take account of considerations of social value, as far as this relates to ecology and nature conservation. For example, a local nature reserve or site of value for conservation education should be taken into account. It is important to ensure appropriate integration with the other relevant topic areas with regard to this issue.

Impacts on certain ecological resources may have financial implications. Whilst it is not intended that economic value be subsumed within the valuation of ecological resources, it is important to recognise, within the ecology and nature conservation topic, these financial implications and to ensure effective integration with other related topic areas.

The likely impacts on some species and groups (e.g. deer) need to inform project design and mitigation as a result of potential road safety and animal welfare issues, even when these are not selected as key receptors and/or the impacts upon their populations are not assessed as significant.

3.4 Impact assessment

3.4.1 General guidance

It is necessary to assess impacts, on an iterative basis, at several stages during project development: guidance is presented in Section 3.2 on the broad assessments necessary during the initial project management phases and to underpin selecting the key ecological receptors for which detailed assessment is required, on the basis of ecological value and likely significant impacts. More detailed impact assessment is then required during the latter stages of project development, in order to identify the need to avoid impacts, to help design mitigation measures and inform the assessment process. This should be reviewed as the project progresses to take account of design changes. As the impact assessment process continues, it will be necessary to distinguish between those design changes seeking to avoid or reduce impacts that go on to form an integral part of project design (and should therefore be assessed as part of the ‘unmitigated project’), and those that represent additional mitigation measures. Wherever possible all mitigation measures should be incorporated in project design, as that design progresses, on an iterative basis; however, for impact assessment purposes the ‘unmitigated project’ should include those measures where delivery is unequivocal and success is highly likely. Where more uncertainty exists, the

measures should be assessed as ‘mitigation’. For example, alterations in vertical adjustment and/or land-take to avoid impacts on an area of valuable habitat would properly be identified as an integral part of scheme design (and thus part of the ‘unmitigated project’). An operation to translocate an area of habitat that would otherwise be destroyed during site clearance would be an additional ‘mitigation’ measure. Once the mitigation measures have been refined and their likely success considered, it is necessary to assess any residual impacts. If significant adverse impacts remain likely, it may be appropriate to design measures to off-set these; once again, the positive impacts of these measures should also be assessed. (These issues are also addressed, in relation to impacts on European sites, in Section App.II.iv.c.)

The basis of the impact assessment should be a determination of which ecological resources within the ‘zone of influence’ are both of sufficient value to be material in decision making and, therefore, included in the assessment (valuation is described in Section 3.3) and likely to be affected significantly (determination of impact significance is addressed in Section 3.4.4). In the context of national road projects, ecological resources of below ‘Local Importance (higher value)’ should not be selected as ‘key ecological receptors’ for which detailed assessment is required.

3.4.2 Baseline conditions and cumulative impact assessment

The impact assessment should be undertaken in relation to baseline conditions within the zone of influence at the time of the proposed activities, in the absence of the project. Construction-phase impacts should relate to the date by which construction activities are anticipated to commence and their likely duration. Similarly, operational impacts should refer to predicted baseline conditions during the design life of the national road project.

It is necessary to predict future baseline conditions on the basis of:

- ⊙ environmental trends, including climate change;
- ⊙ locally-important factors such as changes associated with likely future management and land-use;
- ⊙ completed developments or developments currently under construction that could affect resources within the zone of influence in the future; and
- ⊙ other developments for which planning consent has been granted that also could affect resources within the zone of influence in future.

3.4.3 Characterising impacts

Having identified the project activities likely to give rise to significant impacts (as described in Section 3.2.1), it is then necessary to describe the resultant biophysical changes and to characterise the impacts on the ‘key ecological receptors’. In doing so, it will be important to liaise with colleagues in the project team, to ensure that the implications of these changes, e.g. in hydrology, noise or air quality, are fully understood and that there is appropriate integration between disciplines. It is necessary to ensure that any assessment of impact is sufficiently comprehensive:

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it needs to take account of impacts associated with construction and operation; direct, indirect and synergistic¹³ impacts; and those that are temporary, reversible and irreversible.

It is important that when identifying impacts, explicit reference is made to the aspects of ecological structure and function on which the key receptor depends, and that these are followed-through during the characterisation procedure.

The process of impact characterisation helps to build-up a balanced understanding of the nature of each impact and receptor. Consideration should be given during this process to the interactions between ecological receptors. For example, the loss of a particular habitat may have implications not just for those species directly living within or using that habitat, but also for others that may interact with those species.

When characterising impacts, wherever possible reference should be made to the following parameters:

3.4.3.1 *Magnitude*

‘Magnitude’ should be predicted in a quantified manner wherever possible and relates to the quantum of an impact, for example the number of individuals affected by an activity.

3.4.3.2 *Extent*

‘Extent’ should also be predicted in a quantified manner and relates to the area over which the impact occurs. Where the receptor is in an area of a particular plant community for example, Extent=Magnitude.

3.4.3.3 *Duration*

‘Duration’ is intended to refer to the time during which the impact is predicted to continue, until recovery or re-instatement (which may be longer than the impact-causing activity). This should be quantified wherever possible, and interpreted in relation to the ecological processes involved rather than on a human timescale.

3.4.3.4 *Reversibility*

‘Reversibility’ should be addressed by identifying whether an impact is ecologically reversible (either spontaneously or through specific action) and whether such an outcome is likely.

3.4.3.5 *Timing and frequency*

The timing of impacts in relation to important seasonal and/or life-cycle constraints should be evaluated. Similarly, the frequency with which activities (and concomitant impacts) would take place can be an important determinant of the impact on receptors and should also be assessed and described.

¹³ Synergistic impacts occur where two or more impacts/impact types act together to create a combined effect on one or more receptors greater than the sum of their separate effects.

3.4.3.6 Integration of impact characteristics

An informed integration, for each potentially significant impact, of each of these impact characteristics is necessary in order to underpin the determination of impact significance set out below.

In each case, it is important to assess the likelihood that the change will occur as anticipated and that the impact on ecological structure and function will manifest as predicted. Wherever possible, this should be based on previous evidence. The following scale should be applied (adapted from IEEM 2006):

- Near-certain: >95% chance of occurring as predicted
- Probable: 50-95% chance of occurring as predicted
- Unlikely: 5-50% chance of occurring as predicted
- Extremely unlikely: <5% chance of occurring as predicted

3.4.4 Determining impact significance

3.4.4.1 Effects on conservation status of 'key ecological receptors'

A likely change in 'conservation status' should be used as a measure to determine whether an impact on a habitat or species is likely to be significant, and it should be evaluated at whichever geographic scale is appropriate (see below).

In the context of ecological impact assessment of national road development projects, conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area. Thus, an impact will be significant if it would affect the long-term distribution, structure or function of the habitat in question as well as the long-term survival of its associated species, at the appropriate geographical scale.

Similarly, the conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the appropriate geographic scale. Thus, an impact will be significant if it would affect the long-term distribution or abundance of the species' populations at the appropriate geographic scale.

For those species or habitats for which conservation objectives or targets have been set, then any impact which would inhibit the achievement of those targets would also be considered significant, at the geographic scale at which the target has been set.

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3.4.4.2 *Effects on integrity of 'key ecological receptors'*

Likely effects on 'integrity' should be used as a measure to determine whether an impact on a site is likely to be significant. For this to be a valid approach, the site in question needs to be sufficiently complex to recognise ecosystem processes and functions. Otherwise it will be more appropriate to consider potential changes in the conservation status of the site's component habitats and species (see above).

In the context of ecological impact assessment for national road development projects, 'integrity' should be regarded as the coherence of ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued. Impacts resulting in adverse changes to those ecological structures and functions would be considered to be significant.

3.4.4.3 *Process of assessing significance*

In this process, significance of ecological impact is determined empirically, on the basis of an analysis of the factors which characterise it, irrespective of the value of the receptor. Significance is determined by effects on conservation status or integrity, regardless of the geographical level at which these would be relevant.

If impacts are not found to be significant at the highest geographical level at which the resource has been valued, they may be significant at a lower level, and this should be tested sequentially. Similarly, impacts that do not affect the integrity of a site, may nevertheless affect the conservation status of a valuable constituent habitat or species, at a lower geographic scale. An equivalent approach also needs to be applied to mitigation and enhancement measures, which may have a significant beneficial impact, but at a higher or lower geographic scale than the value of the receptor to which they have been applied.

Key Ecological Receptor: principal elements of ecological value	Construction-phase Impacts	Operational Impacts	Ecological Significance if Unmitigated
Mixed deciduous/coniferous woodland habitat	<p>There would be permanent loss of approximately 4 ha of woodland habitat along a boundary of the wood associated with land-take for the scheme (the road would be in a shallow cutting at this point).</p> <p>There would also be the potential for direct/indirect impacts on woodland habitat immediately adjacent to the land-take area as a result of physical damage to trees and compaction of the ground in the vicinity of the roots; increased exposure to windthrow in the future; trampling of ground flora associated with construction activities; and alterations in local hydrology. In the absence of mitigation, it is probable that this would occur, and would affect a further approximately 2 ha of woodland habitat.</p>	<p>Deposition of airborne pollutants (NO_x, ammonia, metals) and salt spray drift onto vegetation and soils adjoining the verge.</p>	<p>In this case it would be most appropriate to consider the significance of these impacts in combination, in terms of integrity of the site as a whole. It is considered that the impact on the site would be significant, primarily on the basis that: approximately 10% of the valuable woodland habitat would be lost, with a further 5% affected indirectly, meaning that ecological structure and function would be affected across a substantial proportion of the site. This loss of habitat could also threaten the viability of the red squirrel population; an important element of the ecological resources for which the site has been valued.</p>
Stream	<p>Potential indirect, temporary impacts as a result of hydrocarbon contamination and siltation associated with installation of a new culvert upstream (beyond the woodland boundary). In the absence of mitigation, it is probable that this will occur.</p>	<p>None. No operational discharge is proposed to this stream.</p>	
Rare/protected plant species Red squirrel	<p>No impacts envisaged as no specimens occur within or close to the land-take area.</p> <p>Individuals within the population would be affected by permanent losses of feeding resources and existing/potential drey sites. There would be the potential for the incidental mortality of individuals, including dependant offspring associated with site clearance (timed for September/October). On the basis of the detailed surveys completed to date, the risks of direct mortality are likely to be low. Disturbance to individual squirrels through construction noise and visual disturbance, and lighting is considered likely.</p> <p>Given that habitat loss would occur along a woodland boundary, no additional impacts of fragmentation are predicted, associated with the woodland population. Similarly, no habitat features linking these animals with a wider squirrel population would be severed by the scheme and thus there would be no additional fragmentation effects.</p>	<p>None.</p> <p>Some possibility of future road traffic-related mortality of small numbers of squirrels, but this is considered unlikely. No continuing effects of fragmentation.</p>	

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Key Ecological Receptor: principal elements of ecological value	Construction-phase Impacts	Operational Impacts	Ecological Significance if Unmitigated
Badger	Main sett would not be affected directly as >30m from land-take. Some temporary disturbance of individuals when foraging as a result of construction noise and visual disturbance, and lighting, for those periods where night-time working is necessary. Land-take would entail some loss of foraging resources and would fragment the resident social group's existing territory.	The resident badgers would be expected to continue to access their territory but would be at increased risk of road traffic-related mortality. An increase in local mortality rate is considered 'probable'. ¹⁴	There would be no direct impacts on the main sett within the wood and thus badgers do not contribute to the assessment of significance outlined above. The impact on this social group would be a likely increase in the number of badger road deaths, and the majority of these are likely to occur beyond the site boundaries. It is also likely that other nearby groups would experience an increase in mortality rate associated with the new road scheme; it would therefore be appropriate to deal with badgers as a separate receptor, but on a scheme-wide basis.

Table 3: An illustrative example of impact characterisation and determining significance

¹⁴ Had a median barrier been included in the design of this part of the new road, it would have been necessary to take account of the fragmentation of territorial resources as well as increased rates of mortality.

3.5 Mitigation measures

The development of mitigation measures should be an iterative process, throughout project design. These measures need to be fully integrated into the project proposals and should involve elements of avoidance, reduction and restoration, in that order of priority. Mitigation measures should be developed primarily to address any significant impacts on key ecological receptors that have been revealed during the impact assessment process. However, some measures may also be necessary to ensure legislative and policy compliance; for example, when dealing with protected species that have not been identified as key ecological receptors, or for which significant impacts are not anticipated.

In each case, the appropriate form of mitigation should be tailored to the nature of the receptor and the impact being mitigated. Furthermore, the measures should be designed and presented in terms of the integrity or conservation status of the resources or features to which they apply. This ensures that the mitigation measures address significant impacts directly; allows them to be assessed more readily in terms of residual impact significance (see below); and monitoring, and remedial actions can be more effectively targeted. Decisions on the design of mitigation should be reached through consultation with the appropriate statutory and non-statutory bodies. It is imperative that the proposed mitigation can be justified in terms of likely success and cost-effectiveness.

It is important to set aims for mitigation measures at an early stage. Where mitigation measures are developed to address impacts on key ecological receptors, the aims should be determined on a case-by-case basis and as a minimum, and where appropriate, should seek to ensure that any residual impacts would not be significant. In some situations, it may be appropriate to set an aim of returning a receptor to pre-construction conditions. In specific circumstances, some mitigation measures may need to involve additional resources, on a precautionary basis, to take account of uncertainty with regard to the success of the proposals, but again the cost-effectiveness of such an approach should be ascertained.

In each case, it will be necessary to appraise the likely success of mitigation measures against the aims that have been set for them, ideally with reference to equivalent measures that have been employed in similar situations on previous projects. This appraisal should then inform:

- (a) decisions concerning the extent and type of mitigation to be employed, for example, it may be appropriate to specify a greater extent and number of alternative treatments for mitigation measures with a more uncertain outcome; and
- (b) the assessment of residual impacts.

In addition to potential deficiencies inherent in the mitigation measures themselves, it is necessary to identify external factors that also contribute to uncertainty of outcome. In situations where, for example, sites may be impacted by climate change consideration should be given to the use of less climate change sensitive options.

The assessment should only take account of mitigation proposals that have been fully agreed and incorporated within the design and construction process. Mitigation that cannot be guaranteed to be delivered should be clearly identified as such and should not be taken into account when assessing residual impacts.

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3.6 Residual impacts

The significance of any residual impacts should be assessed by evaluating the likely effectiveness of the proposed mitigation in addressing the impacts on integrity and conservation status of each of the key ecological receptors. In doing so, the projected outcome and uncertainty of the mitigation measures should be taken into account.

Key Ecological Receptor: principal elements of ecological value	Mitigation	Residual Impact
Mixed deciduous/coniferous woodland habitat	<p>Habitat loss would be minimised by reducing land-take through the construction of a retaining wall in place of a graded cutting slope; amount of woodland habitat removed now approximately 0.25ha.</p> <p>Hydrological (draw-down) effects would be minimised through the installation of a clay seal along the edge of the land-take parallel to the woodland. This measure would have a probable chance of success.</p> <p>The likelihood of future windthrow would be reduced by coppicing selected shrubs and trees in advance of site clearance, to establish a new woodland edge as rapidly as possible. This measure would also have a probable chance of success.</p> <p>The likelihood of damage to adjoining woodland habitat would be avoided by the use of protective fencing established at the outset and 'tool-box talks' to contractors (see NRA 2007); all construction works to be undertaken in strict compliance with NRA Guidelines (e.g. NRA 2006d). These measures have a probable chance of success.</p> <p>Landscape planting undertaken in this location to comprise an appropriate species-rich mixture of locally-provenant trees and shrubs, and designed to link with the existing woodland habitat and, in the longer-term provide linear extension to the woodland along the verge to either direction, comprising approximately 2ha.</p>	<p>The impact on this feature would no longer be significant, primarily on the basis that: now 0.6% of the woodland habitat would be lost and it is unlikely that there would be substantial indirect effects on the remainder. Thus ecological structure and function would be expected to remain unaffected. In the longer-term, the area of new planting may actually represent a net beneficial effect.</p> <p>Similarly, it is likely that the red squirrel population would remain viable: given the size of their home ranges and the fact that a narrow strip of habitat removal along the edge of a wood would probably involve very small losses from several ranges, it is likely the loss of resources from any individual squirrels would be insignificant.</p> <p>NB. Having assessed the residual impacts on the site of County Importance to be not significant, it would be appropriate also to consider separately the residual impacts on semi-natural woodland habitat, red squirrels and badgers, in the context of their local conservation status, in the event that there would be a significant impact at that (lower) level. In this case, however, it is unlikely that any of these impacts would be significant, even at the local level.</p>
Stream	<p>Culvert construction in compliance with NRA Guidelines (2005c), incorporating effective pollution controls. These have a 'probable' likelihood of success.</p>	
Rare/protected plant species	<p>No additional measures required; already avoided.</p>	
Red squirrel	<p>The measures above would also serve to mitigate the majority of the impacts on red squirrels. In addition, the felling and removal of trees would be undertaken in a manner that minimises the likelihood of killing adult squirrels and would now take place in December, further reducing the likelihood of encountering dependent young. This would increase the confidence in avoiding squirrel mortality during construction to near-certain.</p>	
Badger	<p>Future road traffic-related mortality of badgers would be minimised through the provision of badger-resistant highway fencing to direct the animals to a nearby mammal underpass. This measure would be focussed in part on mitigating the effects of road operation on the woodland site and its constituent species, but would also form part of a wider, scheme-wide provision, with the intention of minimising impacts on the local badger population and improving road safety on the new scheme.</p>	

Table 4: An example illustrating mitigation options and residual impact assessment

Guidelines for Assessment of Ecological Impacts
 of National Road Schemes

3.7 Informing project appraisal and integration with other topics

Reference should be had to the NRA's *Project Appraisal Guidelines* (2008d) and *National Roads Project Management Guidelines* (2000) (and any relevant revisions or amendments to these documents) on the issue of 'informing project appraisal and integration with other topics.'

In summary, the residual impacts identified (in the manner outlined above) should be interpreted in the context of the geographic scale at which the receptor they affect has been valued. The analysis of all residual impacts will then form the basis of a quantitative statement (NRA, 2008d). This quantitative statement, along with required qualitative statements, will form part of the Project Appraisal Balance Sheet ('PABS') (NRA, 2008d).¹⁵ The quantitative and qualitative statements will then be interpreted and a scaling statement devised that ranks the complete selected route on a seven-point scale.

3.8 Compensation and related measures

In the context of assessment procedures for national road projects, 'compensation' refers to measures to address residual impacts on European sites (e.g. Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or *proposed* Special Areas of Conservation) or protected species. This is set out in more detail in Appendix II and Appendix III.

3.9 Enhancement measures

Road projects routinely present opportunities to enhance ecological resources in their immediate vicinity, for example, through the creation of habitat features parallel to the scheme that link otherwise fragmented sites, or through improvements in pollution controls. These often do not address specific (or significant) adverse impacts, but may nevertheless be considered worthwhile. Where these contribute to project objectives and/or national or local policies, they should be adopted in a cost-effective manner, with priority given to those measures that would make a meaningful contribution to the local conservation status of the habitats or species in question.

¹⁵ The PABS will provide an overview of the costs and benefits of the road project.

CHAPTER 4

**Constraints Study
(Natural Environment
Section)**

Guidelines for Assessment of Ecological Impacts of National Road Schemes

CHAPTER 4 CONSTRAINTS STUDY (NATURAL ENVIRONMENT SECTION)

4.1 Objectives

The objective of the natural environment section of the CS is to identify the international, national, county and local issues that must be taken into account when planning and designing roads so that the phases which follow (RCS study and EIS) can be planned properly. For the natural environment, this includes the main ecological constraints that should be avoided or that could affect the design of the scheme, delay progress or influence the costs.

4.2 Approach

The natural environment section of the CS is primarily a desk exercise that comprises a search for available information, or information that can be readily obtained.

One of the first exercises to be completed during the CS phase is defining the CS area. In terms of the natural environment (note that other disciplines may required additional areas to be considered), the extent of the CS area should based on the broad corridor within which route corridor options are likely to be located and their potential zones of influence (see Section 3.2.2). In defining the CS area one should take into account the full range of impacts that could arise including, for example, indirect impacts on wetlands and river systems or impacts on highly mobile groups such as bats and birds that could be associated with important sites some distance from the project.

Following definition of the CS area a review of available information should be completed, after which the ecological resources present in the CS study area should be presented in the CS Report. The CS Report should include summary details of the ecological resources within the study area and a map that shows the location and extent of these constraints.

Consultations with the Department of Environment, Heritage and Local Government and the relevant Regional Fisheries Board should be initiated. Details of the statutory designations and protection for sites and species, or legislative requirements regarding the environment, should be established.

CONSTRAINTS STUDY (NATURAL ENVIRONMENT SECTION)

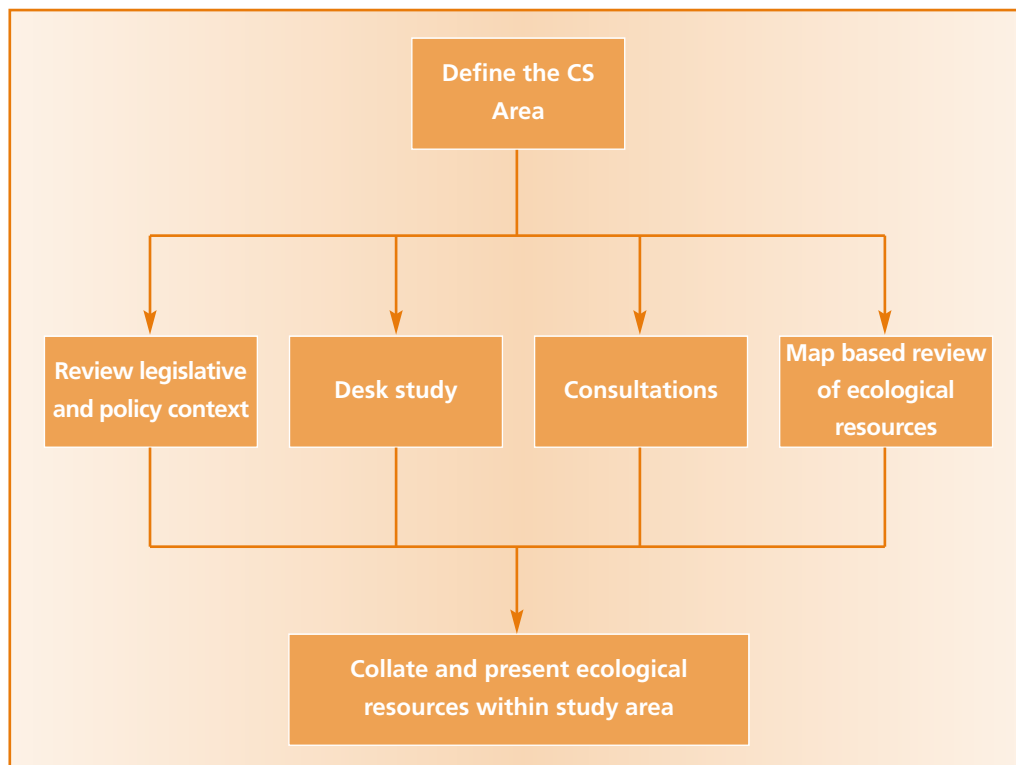


Figure 2: Constraints Study Procedure

4.3 Contents of the Constraints Study (Natural Environment Section) Report

4.3.1 Methodology

The CS should include a statement of how the natural environment section of the CS was prepared, including data and information sources, consultations with relevant agencies, methods and dates of any field surveys and how the ecological resources have been valued. Any limitations in the methodology or in the approach adopted should be highlighted.

4.3.2 Background information on the study area

The CS should include a brief overview of the existing environment and ecological resources within the study area, including topography and landscape features, the main land uses, designated conservation areas, the main habitats of conservation value and the main water or drainage features.

The CS Report should consider and provide summary details of the following ecological constraints (where applicable):

- ⦿ Designated conservation areas and sites proposed for designation (see Section 2.2) within the study area,
- ⦿ All the main inland surface waters (e.g. rivers, streams, canals, lakes and reservoirs) that are intersected by the study area, including their fisheries value and any relevant designations,

Guidelines for Assessment of Ecological Impacts of National Road Schemes

- All major aquifers and dependent ecosystems (cooperation will be required with hydrogeologists working on the project),
- Any intertidal and marine areas within the study area,
- Any known or potentially important sites for rare or protected flora or fauna that occur within, or in close proximity to, the study area,
- Any other sites of ecological value, identified from aerial photographs, within or in close proximity to the study area (see Section 2.3),
- Any other relevant conservation designations or programmes (e.g. catchment management schemes, habitat restoration or creation projects, community conservation projects, etc),
- Any other features of particular ecological or conservation importance within the study area.

The legal status of all the ecological constraints and the implications for new road schemes should be clearly identified. Any other information relevant to the ecological constraints should also be set out.

4.3.3 Details of ecological constraints

Designated conservation areas should be listed with their site name, site code(s), conservation status/designations, county, location relative to the study area and a brief description of the main features of the site, including the key habitats and species present (see example in Box 1). The CS report should contain a map of all designated conservation areas which could be affected, either directly or indirectly, by a national road project within the study area. Indirect effects could include hydrogeological impacts on groundwater dependant sites or water quality/quantity impacts on water bodies.

It is essential that the location and extent of designated conservation areas are updated throughout all phases of project planning. This information can be checked online at <http://www.npws.ie/en/MapsData/>. However, regular communication with the Site Designations and Plans Unit of the National Parks and Wildlife Service is recommended.

As outlined in Appendix II, European sites warrant additional consideration over and above other designated conservation areas. Figure 3 illustrates a flowchart relating to the consideration of European sites during the CS phase. In addition to the information required for other designated conservation areas, the CS report should, where practicable, contain a map of the European sites indicating those parts of the sites containing Annex I priority and non-priority habitats and Annex II non-priority species. Regard should be had to the practicability of collecting this information and this work should generally be confined to desktop studies/collection of information from NPWS.

CONSTRAINTS STUDY (NATURAL ENVIRONMENT SECTION)

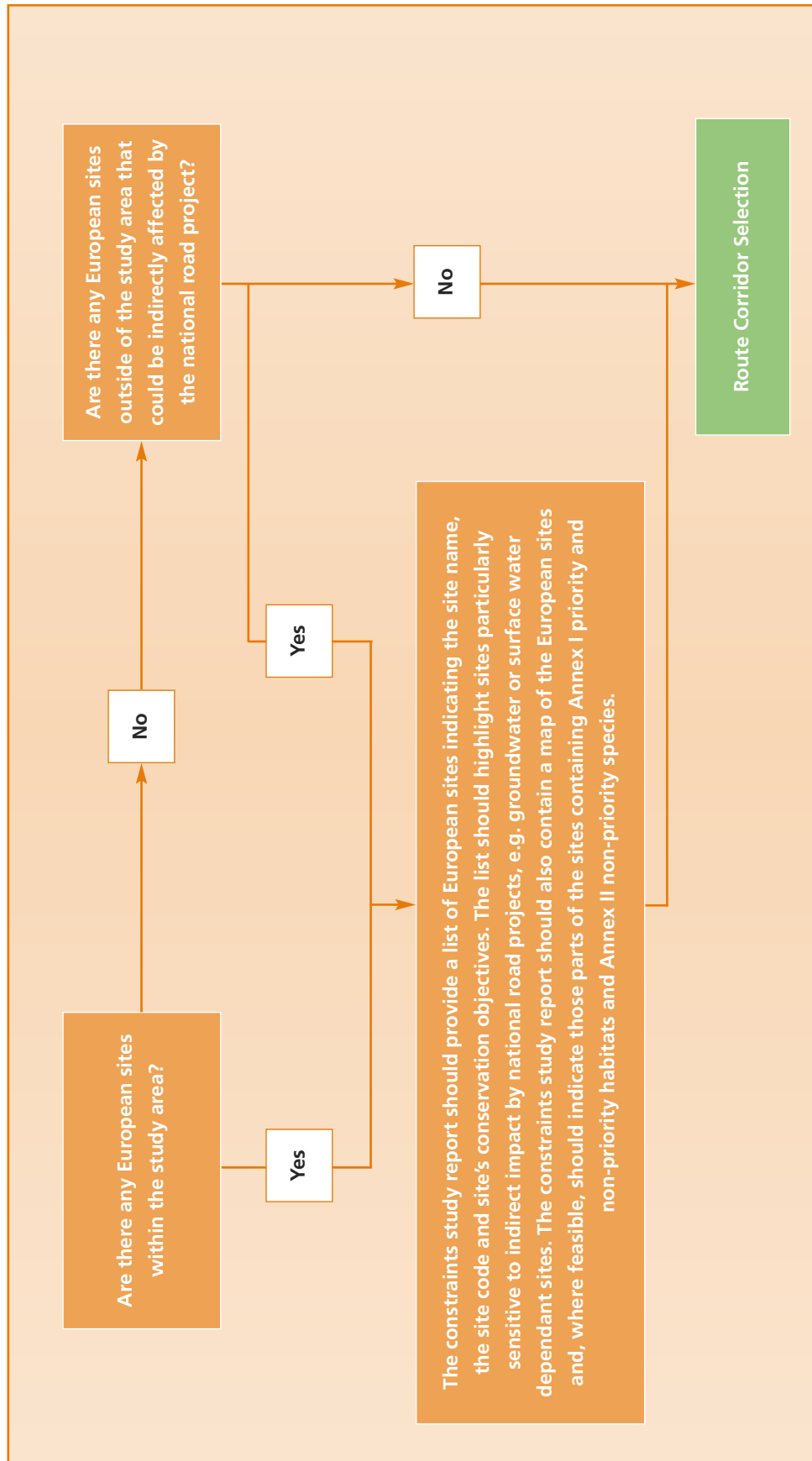


Figure 3: Consideration of European sites during Constraints Study

Guidelines for Assessment of Ecological Impacts of National Road Schemes

Site name	Code	Status	Features of conservation interest/description
Michelstown Cave	651	pNHA	Limestone caves. Important for invertebrates, particularly rare spider species.
Scaragh Wood	971	pNHA	Six blocks of acid oak woodland within a conifer plantation on the south-eastern slopes of the Galtee Mountains.
Aherlow River	2133	cSAC	Designated Salmonid Water (EU Freshwater Fish Directive). River also supports populations of the legally protected species freshwater pearl-mussel and white-clawed crayfish.

Box 1: Example of a list of designated sites/features

All other sites of potential ecological value, including important sites for flora or fauna, should be listed with a site name and a map reference to the feature, with a description of the key features of ecological value as derived from desk studies (particularly aerial photograph interpretation) and any other available information sources. Site details should be tabulated where practicable for ease of reference (see example in Box 2.).

Site no. (map reference)	Site name	Site description/habitat(s)
1	Rock of Cashel	Semi-natural dry grassland on hill; scrub; wet grassland near stream
2	Lough Nahinch	Lakes (partially infilled) with wetland fringe; treelines of broadleaved trees
3	Deerpark	Broadleaved woodland and treeline on old estate
4	Outbuildings at Lismoore	Known maternity colony of common pipistrelle bats
5	Hedgerows north of Broadford.	Network of species-rich, overgrown hedgerows with trees

Box 2: Example of a list of non-designated sites/features

Any documented rare or protected plants within the study area should be listed by species name (common and scientific) and conservation status (see Section 2.4). The general locations of the rare plant sites should be given (site name and grid reference, or site name and code in the case of designated areas), as should an indication of the habitat requirements for each species. Exact locations should not be given to protect rare species from unlicensed collection.

Any documented rare or protected animals should be listed by species name (common and scientific) and conservation status (see Section 2.4). Any other notable populations of animals should also be listed. The general locations of sites, or river/lake systems in the case of aquatic species, or the intertidal or marine area in the case of estuarine or marine species, should be given (site name and grid reference, or site name and code in the case of designated areas), as should an indication of the habitat requirements for each species.

CONSTRAINTS STUDY (NATURAL ENVIRONMENT SECTION)

Inland surface waters should be described in relation to their hydrometric or catchment area numbers, water quality (EPA data where available), drainage characteristics, fisheries value and any other relevant features.

A list of information sources cited in the text should be included.

4.3.4 Figures/maps

Figures to accompany the report should include a map (scale 1:50,000 or larger) of the study area boundaries, ecological sites/features within and in close proximity to the study area (with identifying site codes, site names or numbers), the main surface waters referred to in the text and the general locations of rare or protected species (if they occur outside designated areas). Other figures should be included where necessary, e.g. to clarify details of site boundaries where sites have multiple designations. Up-to-date maps of designated site boundaries should be included in appendices.

Checklist for Constraints Study

- ⊙ List of designated areas (including proposed designations) within the study area - SACs, NHAs, etc.
- ⊙ Any other known sites or features of ecological value
- ⊙ Documented rare and protected species
- ⊙ Documented fisheries value of watercourses
- ⊙ Documented bird sites (IWeBS or other data)
- ⊙ List other important sites from aerial photography
- ⊙ Note major features to be avoided
- ⊙ Highlight any issues for special attention in later phases
- ⊙ Prepare final report
- ⊙ Map of designated areas (including proposed designations) with Annexed Habitats and Species indicated in relation to European sites (where practicable).

Guidelines for Assessment of Ecological Impacts of National Road Schemes

CHAPTER 5

**Route Corridor
Selection Study
(Natural Environment
Section)**

Guidelines for Assessment of Ecological Impacts
of National Road Schemes

CHAPTER 5 ROUTE CORRIDOR SELECTION STUDY (NATURAL ENVIRONMENT SECTION)

5.1 Objectives

RCS typically involves a comparative evaluation of route corridor options. The objective of the study is to evaluate and compare the alternative route corridor options taking account of engineering, environmental, traffic and cost considerations. The ecological impacts for each of the options are identified so that those with unacceptably high levels of impact can be avoided to the extent feasible as part of the overall route assessment process. RCS is the single most effective means of avoiding or reducing ecological impacts.

The NRA's approach to sustainable development requires that economic growth supports social progress while respecting the environment; that social policy underpins economic performance; and that environmental policy is cost effective. Ecological impacts thus have to be seen in the broader perspective of engineering constraints, costs, landscape, cultural heritage, recreation, agriculture and forestry. Each RCS process within the country will have unique features and the constraints may vary. In some cases the optimum route from an ecological perspective may not be the overall optimum route when other impacts and considerations are evaluated. However, ecological considerations should receive detailed consideration and, in some cases, these may be the most important factors to be considered during RCS and subsequent design of the road scheme.

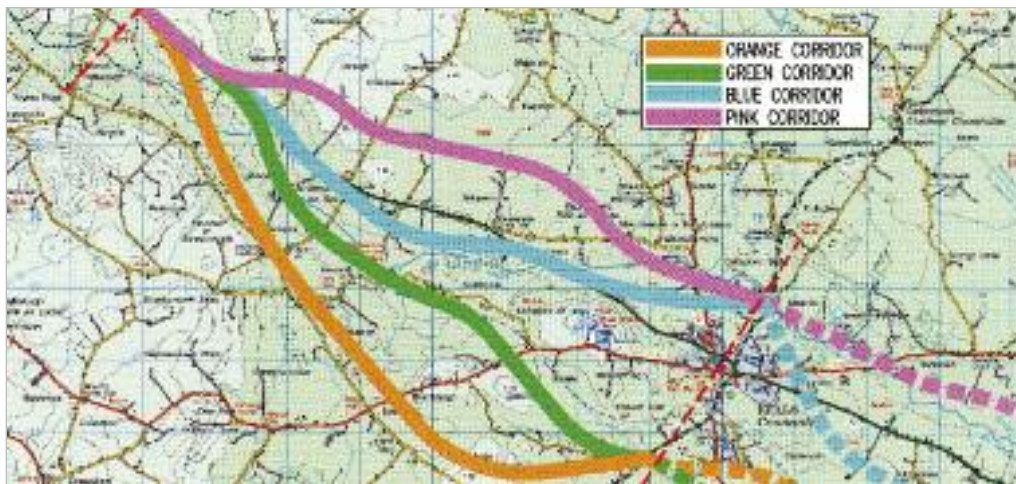


Figure 4: Example of Route Corridor under Review

5.2 Consideration of European sites

A possible case where ecological considerations may constitute the most important factor in RCS is where consideration has to be given to European sites.

In considering European sites during the RCS phase, regard should be had to the flow diagram outlined in Figure 5 and to Appendix II.

At the start of the RCS phase all reasonably practicable efforts should be made to ensure that the initial route corridors selected avoid significant effects on European sites.

ROUTE CORRIDOR SELECTION STUDY (NATURAL ENVIRONMENT SECTION)

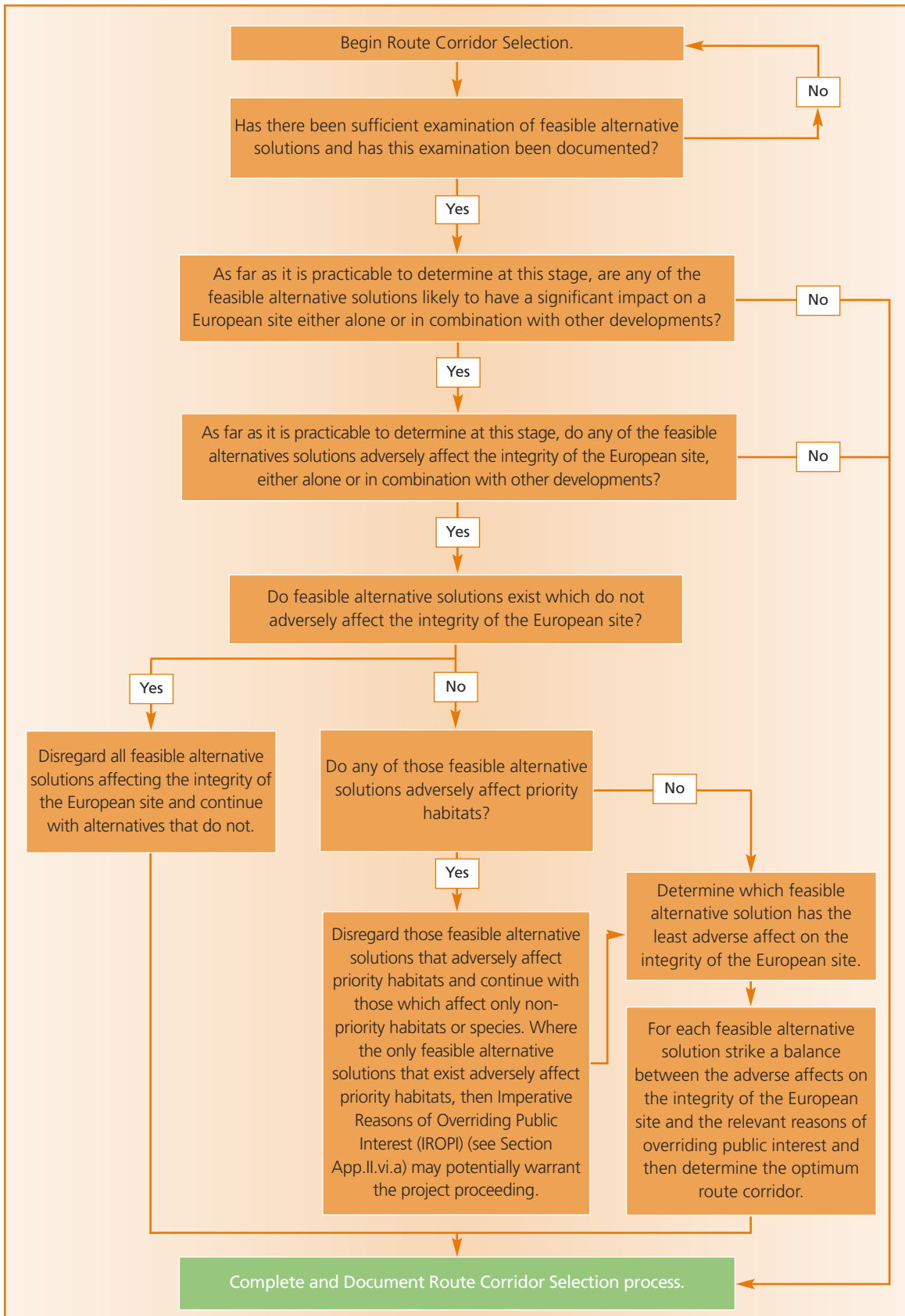


Figure 5: Consideration of European sites during Route Corridor Selection

Guidelines for Assessment of Ecological Impacts of National Road Schemes

5.3 Approach

The Natural Environment section of the RCS study involves the identification of ecological resources/receptors along each of the route option corridors and a broad assessment of the likely impacts upon them. The zone(s) of influence for the route options should take account of the range of impacts likely to arise from construction and operation of them. Following on from the earlier CS, the RCS study should involve a combination of desk study and field survey. At this stage the desk study should be more comprehensive than during the previous phase (a list of sources of information is presented in Appendix I of the ‘Survey Guidelines’).

In those situations where a large number of route options are still being considered (or during the earlier stages of the process), it will not be appropriate to investigate the full length of each route in the field, but rather to restrict field surveys to key sites, features or route sections that appear to be of particular ecological value, to assess the potential impacts of the route(s) upon them. It will also be appropriate to undertake ‘vantage point’ surveys of the remainder of the routes: visual inspections from strategic locations for which access is available, supplemented by, for example, scrutiny of aerial photographs, to ensure that hitherto undisclosed potential constraints are not missed. However, in those situations where a smaller number of options are being considered (or towards the end of the process), it may be more effective to undertake a more comprehensive assessment of each route, in the form of a ‘multi-disciplinary walkover survey’ (the scope and detail of multi-disciplinary walkover surveys are presented in the ‘Survey Guidelines’). Since the aim of this approach is reliably to scope all subsequent surveys and to restrict them to specific locations, this can offer advantages in accelerating the impact assessment process in the latter stages of scheme design.

Further consultations with statutory agencies, including the Department of Environment, Heritage and Local Government and the appropriate Regional Fisheries Board, should be undertaken to seek their views on the proposed routes and on any other issues of concern. Any relevant information about recent or proposed changes in site designations, site boundaries or in the conservation status of species or habitats, should be sought.

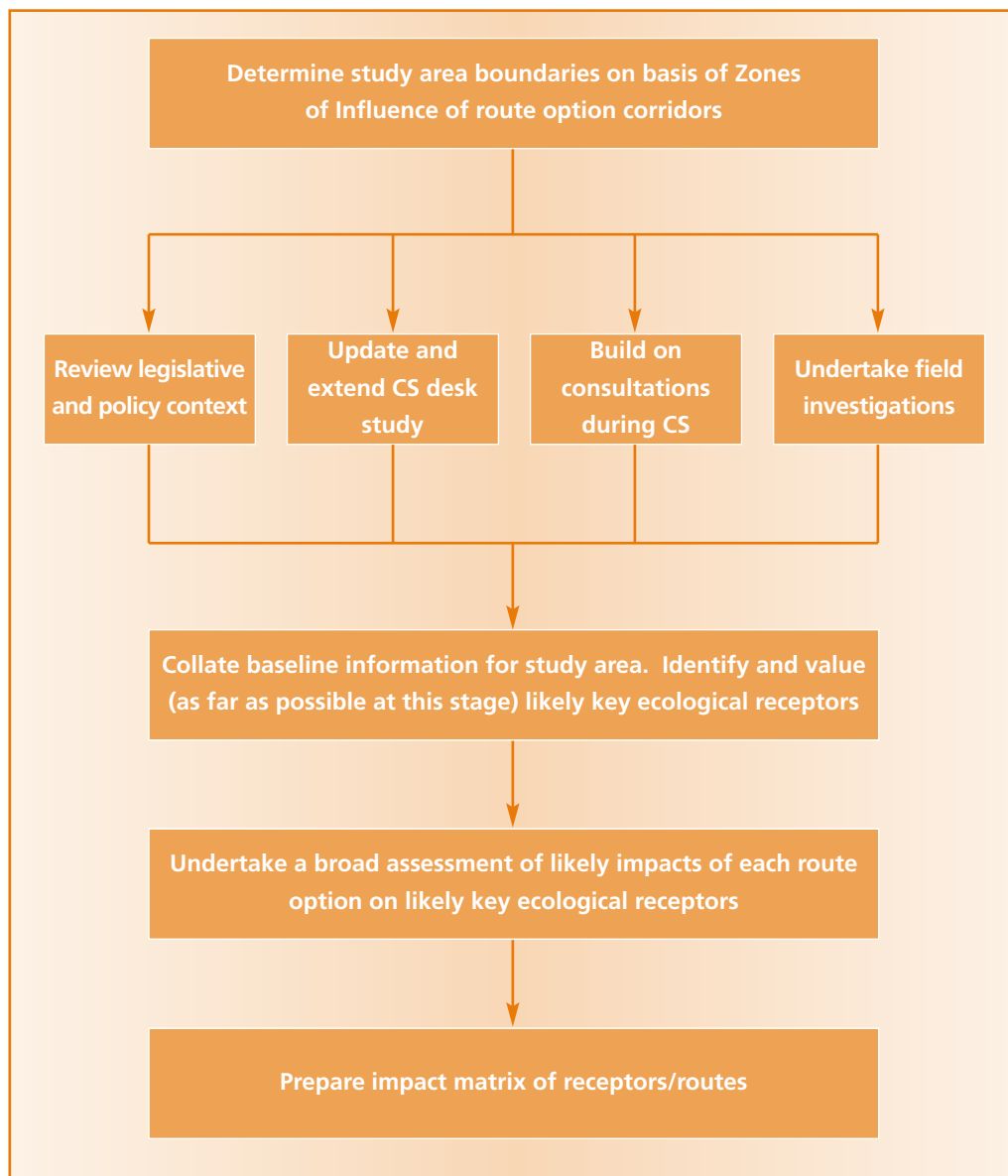


Figure 6: *Route Corridor Selection Procedure*

5.4 Contents of the Route Corridor Selection Study (Natural Environment Section) Report

5.4.1 Methodology

This should include the scope and detail of the desk study and field surveys, including an evaluation of any limitations on this phase of the assessment. This section should also refer to the approach and methods set out in Chapter 3, with regard to scoping, valuation and impact assessment, and indicate how these were applied, in particular, how the boundaries of the study area were chosen.

Guidelines for Assessment of Ecological Impacts
 of National Road Schemes

5.4.2 Baseline information on the study area

This should begin with a brief overview of ecological resources within the study area, along with an update of the relevant information presented in the CS.

The RCS report should include details and descriptions of the following (where applicable):

- ⦿ Designated conservation areas and sites proposed for designation (see Section 2.2) within the zone(s) of influence of any of the route options,
- ⦿ All the main inland surface waters (e.g. rivers, streams, canals, lakes and reservoirs) that are intersected by any of the route corridor options, including their fisheries value and any relevant designations,
- ⦿ Aquifers and dependent systems and turloughs and their subterranean water systems,
- ⦿ Any intertidal and marine areas along any of the route corridor options,
- ⦿ Any known or potentially important sites for rare or protected flora or fauna that occur along or within the zone(s) of influence of any of the route options,
- ⦿ Any other sites of ecological value, that are not designated, along or in close proximity to any of the route corridor options (see Section 2.3),
- ⦿ Any other relevant conservation designations or programmes (e.g. catchment management schemes, habitat restoration or creation projects, community conservation projects, etc),
- ⦿ Any other features of particular ecological or conservation significance along any of the route options.

A preliminary list of key ecological receptors should be compiled for each option, with an indication as to their likely value in a geographical context in some cases, pending a more comprehensive assessment at a later phase of project development. For ease of reference, details of sites and watercourses should be summarised in tables or appendices, together with their site ratings. Updated drawings of boundaries of designated areas are needed.

5.4.3 Assessment of impacts

A broad assessment should be undertaken of the likely impacts of each of the route options on the key ecological receptors, with an indication as to which, if any, of these are likely to be significant, and at what geographical level. The impacts associated with each route option should be tabulated (see Box 3). (For details on overall project appraisal see Section 3.7.)

In the example given in Box 3, three of the sites identified in the CS (see Box 1 & Box 2) are affected by one of the route corridor options (hereafter referred to as Option 1).

ROUTE CORRIDOR SELECTION STUDY (NATURAL ENVIRONMENT SECTION)

Site no.	Site name	Site description/ habitat(s)	Receptor importance	Impact significance
971	Scaragh Wood pNHA	Six blocks of acid oak woodland within a conifer plantation on the south-eastern slopes of the Galtee Mountains	National	Significant negative impact
3	Deerpark	Broadleaved woodland and treeline on old estate	County	Significant negative impact
5	Hedgerows North of Broadford	Network of species-rich, overgrown hedgerows with trees	Local (Higher value)	Significant negative impact

Box 3: Example of some sites (designated and non-designated), the Constraints Study, that would be affected by a possible route corridor option (Option 1)

In the example given in Box 4, the number of significant impacts, at each geographic level, associated with Option 1 (see Box 3) is compared with the number and level of corresponding impacts associated with each of two other illustrative options. This allows an order of preference, from an ecological standpoint, to be determined. In those cases where multiple options would all involve significant impacts on one or more receptors valued at the same geographic level (receptors of international or national importance, in particular), it is not appropriate simply to assign an order of preference on the basis of the number affected. Instead, it will be necessary to characterise the impacts upon them (as far as possible at this stage, using the approach set out in Section 3.4.3) and to apply professional judgement, as appropriate.

Impact Level	Route Corridor Options		
	Option 1 (see Box 3)	Option 2	Option 3
Significant impact on feature of National Importance	1	0	0
Significant impact on feature of County Importance	1	2	0
Significant impact on feature of Local (higher value)	1	4	1
Order of preference	3rd	2nd	1st

Box 4: Summary comparison of impacts on ecological sites of three route corridor options

The levels of impact assigned to particular routes make the assumption that general mitigation measures will be implemented and *this should be clearly stated*. However, site-specific mitigation measures are normally excluded in the assessment of impacts of the scheme, at this stage. Section 3.4.1 presents guidance on distinguishing between routine measures delivered as part of scheme design and additional mitigation.

Guidelines for Assessment of Ecological Impacts
of National Road Schemes

Checklist for route corridor selection study

Includes desk study and field survey

- Define sites from aerial photography,
- List of designated sites (including proposed designations) affected by any route corridor,
- Field visits to designated sites and adjoining habitats, and other sites/features of ecological value; walkover surveys of entire routes as appropriate,
- Brief description and valuation of all ecological resources likely to be affected,
- Adequate documentation of the consideration of European sites,
- Consult the Department of Environment, Heritage and Local Government/National Parks and Wildlife Service on protected species and sites,
- Consult Regional Fisheries Board on fisheries waters,
- Assess likely significance of impacts on affected sites,
- Prepare impact matrix of sites/routes,
- Prepare final report.

CHAPTER 6

**Environmental
Impact Statement
(Natural Environment
Section)**

Guidelines for Assessment of Ecological Impacts
 of National Road Schemes

CHAPTER 6 ENVIRONMENTAL IMPACT STATEMENT (NATURAL ENVIRONMENT SECTION)

6.1 Objectives

The objective of the EIS is to undertake sufficient assessment to identify and quantify any significant impacts on the natural environment likely to arise from construction and operation of the preferred route. The baseline ecological conditions in the area of the proposed road project are described, based on information provided by consultees, background sources of information and the results of surveys carried out for the EIS. In those situations where European sites need also to be considered, additional investigations may need to be undertaken in parallel with the preparation of the EIS, as detailed in Section 6.2.

6.2 Consideration of European sites

The reader should refer to other sections (including Appendix II) dealing with the consideration of European sites.

6.2.1 Screening

The consideration of European sites during the Environmental Impact Assessment phase begins with a thorough review of the RCS report.

Figure 7 illustrates the flow path for the consideration of European sites during Environmental Impact Assessment.

The first stage of this consideration involves a thorough review of all existing or planned (i.e. in receipt of the relevant consent) developments that might act in combination with the proposed road development to produce a likelihood of significant impact on the European sites, if present. Then one should proceed to screen the project and determine if it can be excluded, on the basis of objective information, that the proposed road development will have a significant impact on the European site, either individually or in combination with other plans or projects. Here the precautionary principle operates (see Section App.II.iv.a). Where it can be objectively demonstrated that there is no likelihood of significant effects, then a 'Findings of No Significant Effects Report' should be completed in line with the guidance provided by the Commission. This report should be annexed, as appropriate, to the EIS. Where it cannot be demonstrated that there is no likelihood of significant effects, then efforts should be made to refine the preliminary design by way of realignment, method of construction and/or scheduling proposals to avoid or reduce impacts. Screening should be carried out on this new alternative. This iterative exercise should be carried out until either no further feasible refinement is possible; or until it can be demonstrated that there is no likelihood of significant effects. If it cannot be demonstrated that there is no likelihood of significant effects then appropriate assessment should be carried out. Appropriate assessment is dealt with under Article 6(3) of the Habitats Directive and Regulation 30 of the Habitats Regulations, 1997.

6.2.2 Article 6(3) and Appropriate Assessment

Appropriate assessment must answer the question ‘*is there conclusive evidence, after applying the precautionary principle, that the integrity of the European site will not be adversely affected by the national road project?*’ If the answer to this question is yes, then this ‘positive’ appropriate assessment should be distinctly documented within the EIS. If the answer is no, then mitigation measures should be designed and residual effects predicted. It should then be determined whether the mitigated national road project has an adverse effect on the integrity of the European site. This iterative loop continues until such time as either a positive appropriate assessment can be made; or until no further mitigation is possible and a ‘negative’ appropriate assessment results. Where a ‘negative’ appropriate assessment results, Article 6(4) of the Habitats Directive will apply. The ‘negative’ appropriate assessment should be distinctly documented within the EIS.

[It should be noted that it is in actual fact An Bord Pleanála who carry out the appropriate assessment, not the project proponent. However, the project proponent should provide the information necessary to complete the appropriate assessment within the national road development project EIS and should document their own determination as to whether the assessment is positive or negative. Readers are referred to Section App.II.v regarding these issues.]

6.2.3 Article 6(4)

Readers are referred to Sections App.II.vi and App.II.vii, which outline the requirements imposed by Article 6(4) and discuss ‘Overriding Public Interest,’ ‘Assessment of Alternative Solutions’ and compensatory measures.

6.2.3.1 Overriding Public Interest

It is important that the EIS clearly and distinctly outlines the factors that may be relevant to a determination by the competent authority that the national road project should proceed, notwithstanding an adverse effect, on the basis of imperative reasons of overriding public interest. It is also important to note that where priority habitat are affected, then, subject to a statement on the specific case from the Commission to the contrary, overriding public interest can only be related to human health or public safety, or to beneficial consequences of primary importance for the environment.

6.2.3.2 Assessment of Alternative Solutions

The EIS should detail the assessment of alternative solutions, which will have taken place during the RCS and EIA phases.

6.2.3.3 Compensation

Where no alternative solutions are deemed to exist and where adverse impacts remain, the proposed national road project may still proceed if imperative reasons of overriding public interest warrant it. However, in such circumstances compensatory measures will be required. In designing and assessing such measures; establishing implementation procedures; and designing monitoring plans, close liaison with National Parks and Wildlife Service is required.

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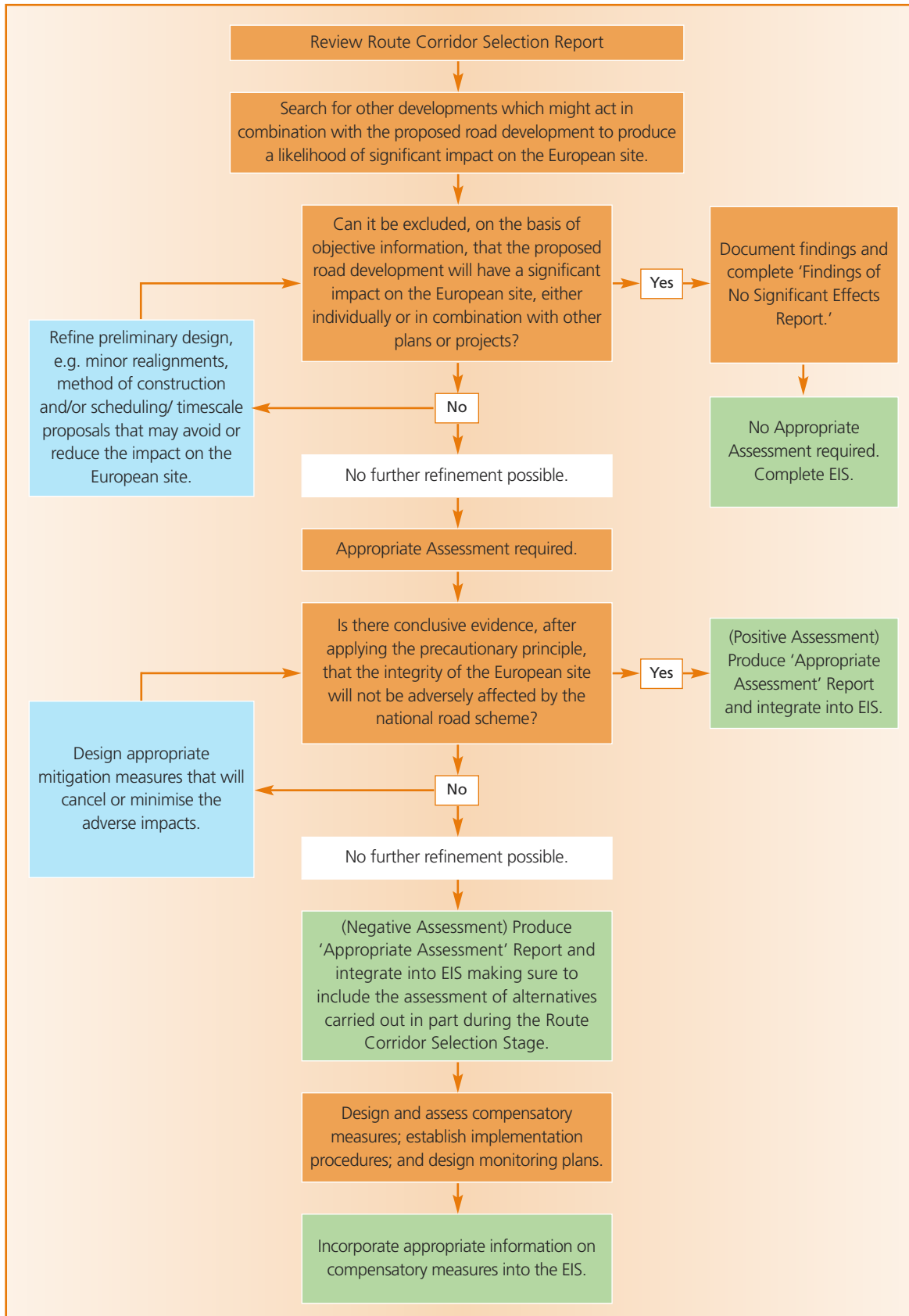


Figure 7: Consideration of European sites during Environmental Impact Assessment

6.3 Approach

In terms of the Natural Environmental section, the EIS has several important roles. The first is to present, within a single document, information that underpins the assessment of the impacts that the construction and operation of a road project will have. The second is to provide information to the general public on the findings of ecological surveys and to interpret for them the likely impacts of the road project in question. Therefore, the EIS needs to include all relevant information to allow the reader to fully understand why particular ecological features have been valued in accordance with the advice in Section 3.3, what the anticipated impacts of the scheme are, in terms of their magnitude, intensity and duration, and what the consequences of these impacts are upon the key ecological receptors and/or protected species that have been identified. It should be clear to the reader how the conclusions have been reached following the guidance set out in Section 3.4.

The natural environment section of the EIS builds on the information contained in the earlier CS and the RCS Study and should involve the following:

- Scoping,
- Consultations,
- Desk study, including review of published/unpublished sources/literature,
- Field/walkover survey with habitat mapping of entire route, link roads, realigned roads and any other areas likely to be affected,
- Further surveys of ecological receptors,
- Assessment and valuation of ecological resources,
- Impact characterisation and assessment,
- Mitigation measures to address significant adverse impacts,
- Measures to off-set significant residual impacts,
- Enhancement measures (where required).

The approach to scoping the EIS should accord with the guidance presented in Section 3.2; this should be followed by a general description of ecological resources in the zone of influence and a clear description of baseline conditions for each of the key ecological resources selected for detailed assessment. Valuation of these key resources should follow the guidance set out in Section 3.3. Impact assessment, the development of mitigation and the treatment of residual impacts should also be undertaken in accordance with Sections 3.4, 3.5 and 3.6.

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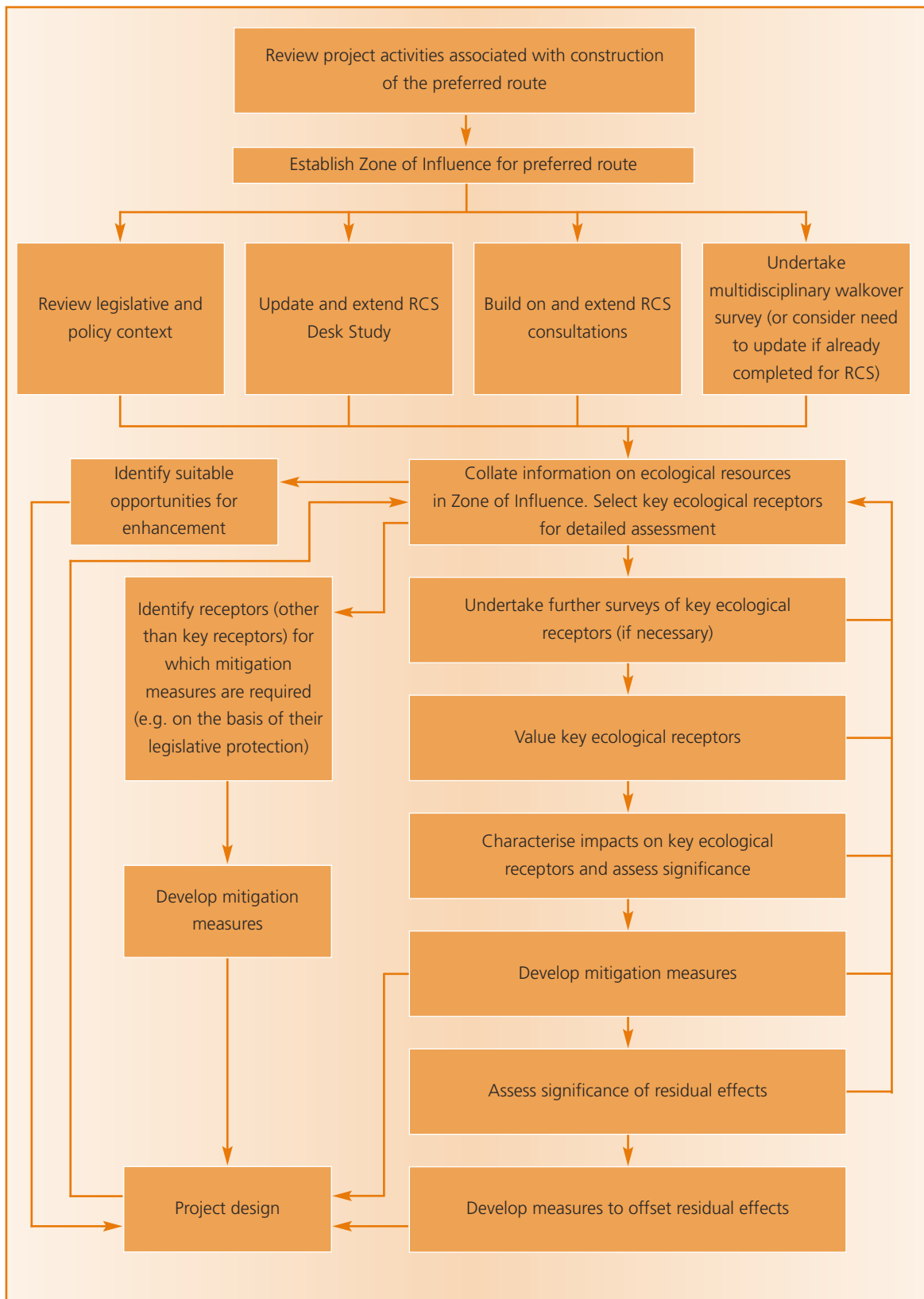


Figure 8: Overview of Ecological Impact Assessment Procedure

6.4 Methodology

6.4.1 Desk study

The desk studies undertaken for the CS and RCS study should be reviewed and up-dated, with further specialist sources of information approached as necessary, depending upon the results of the on-going scoping exercise. Further guidance on refining the scope of desk studies and a list of suggested contacts, is presented in the ‘Survey Guidelines’.



Figure 9: Example of habitat mapping using aerial photography for an EIS on a road scheme (Habitat codes from Fossitt (2000))

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6.4.2 Field survey

6.4.2.1 Multi-disciplinary walkover survey

If a multi-disciplinary walkover survey has not already been undertaken as part of the RCS study, this should be undertaken at the outset, to help refine the scope of any further surveys, and to underpin the selection of the ‘key ecological receptors’. Guidance on undertaking multi-disciplinary walkover surveys is presented in the ‘Survey Guidelines’. For many receptors, sufficient information will be collected from this survey to inform the remainder of the impact assessment.

6.4.2.2 Further Surveys

In the case of some key receptors, further habitat-, group-, or species-specific surveys may be necessary in order reliably to confirm their presence, their value and/or to help characterise the impacts upon them. Guidance on survey techniques for flora and fauna in the context of EISs for National Road Schemes is presented in the ‘Survey Guidelines’.

6.4.3 Impact Assessment and mitigation

The impact assessment methodology and approach to mitigation should follow the procedures detailed in Sections 3.4 and 3.5.

6.4.4 Non-technical summary (natural environment section)

This is required under the EIA legislation. The natural environment section of the non-technical summary may comprise just a few paragraphs and should be laid out in a similar but condensed format to that in the main EIS. It should be short and avoid technical terms but should make reference to all the above information. It may be produced as a separate and self-contained document that can be widely distributed to the general public.

Checklist for Environmental Impact Assessment

Includes desk study and field survey of entire route

- ⊙ Updated desk study,
- ⊙ Multi-disciplinary walkover survey (including habitat survey of entire route),
- ⊙ Further surveys of key ecological receptors (if required),
- ⊙ Selection of key ecological receptors for detailed assessment,
- ⊙ Presentation of baseline conditions, incorporating collated results of desk study, walkover survey and further surveys (summary in EIS text, detail in Technical Appendices),
- ⊙ List survey/assessment limitations,
- ⊙ Comprehensive impact assessment,
- ⊙ List of significant impacts,
- ⊙ Mitigation measures,
- ⊙ List of significant residual impacts,
- ⊙ Measures to off-set residual impacts,
- ⊙ Enhancement measures (where required).

CHAPTER 7

**References cited
in the Text and
Other Relevant
Literature**

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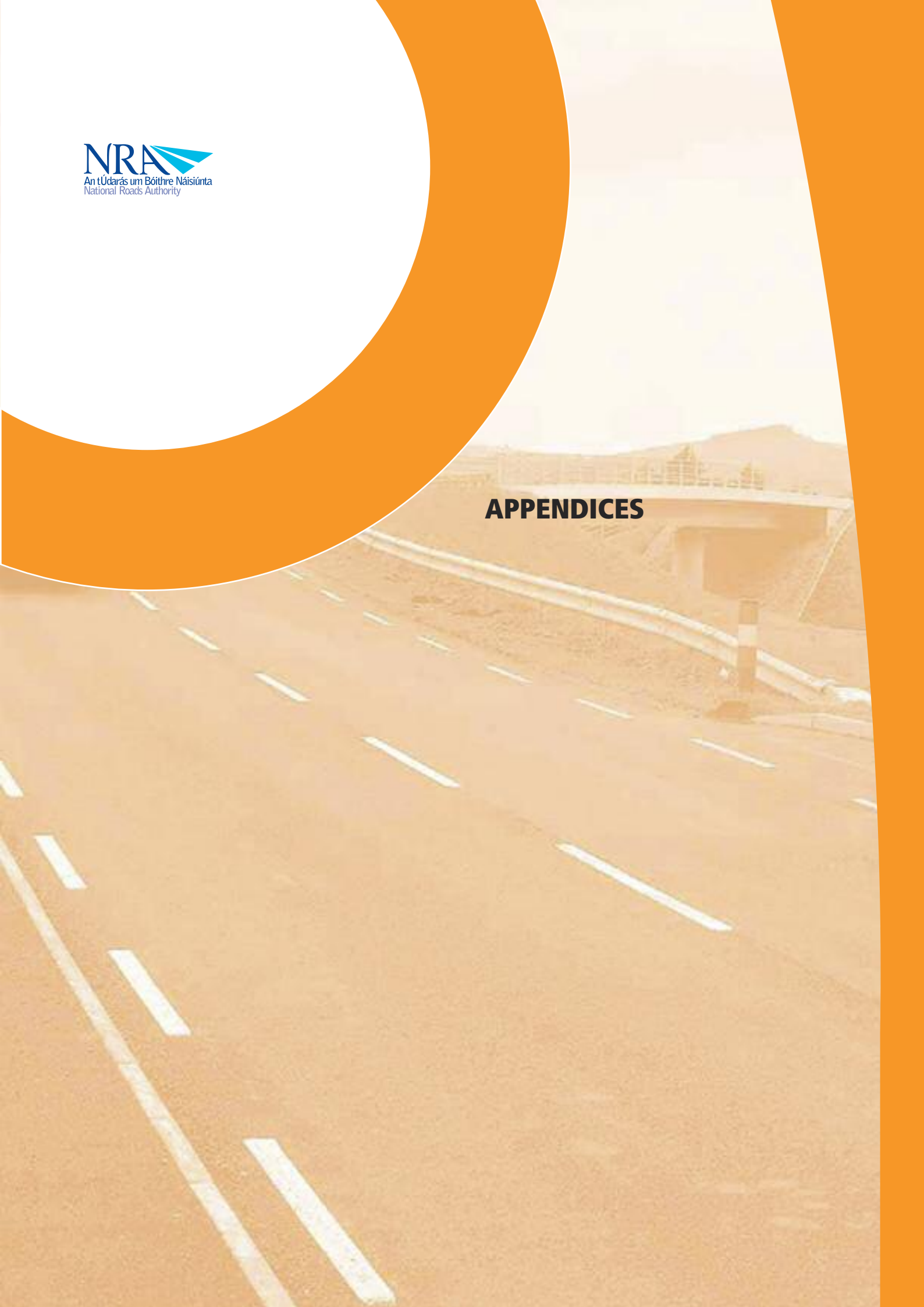
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APPENDICES



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APPENDIX I DESIGNATED CONSERVATION AREAS IN THE REPUBLIC OF IRELAND

For more information on these designations see Hickie (1996) and/or consult the Department of Environment, Heritage and Local Government.

Abbreviation	Full title	Status	Supporting legislation or convention (if any)
SAC	Special Area of Conservation	International	EU Habitats Directive (92/43/ECC)/Habitats Regulations, 1997 to 2005
SPA	Special Protection Area	International	EU Birds Directive (79/409/ECC)/Habitats Regulations, 1997 to 2005
None	Ramsar Site	International	Ramsar Convention on Wetlands
None	Biogenetic Reserve	International	None
None	UNESCO Biosphere Reserve	International	None
None	Salmonid Water	International	EU Freshwater Fish Directive (78/659/EEC)/European Communities (Quality of Salmonid Waters) Regulations, 1988
NHA	Natural Heritage Area	National	Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000
SNR	Statutory Nature Reserve	National	Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000
NP	National Park	National	none
None	Refuge for Fauna and Flora	National	Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000
None	Wildfowl Sanctuary	National	none

APPENDIX II APPROPRIATE ASSESSMENT

App.II.i Introduction

The Habitats Directive¹⁶ requires an ‘appropriate assessment’ to be carried out where a development, such as a national road project, is likely to have significant impacts on SACs, SPAs and/or Sites of Community Importance (SCIs).¹⁷ With regard to proposed road developments, the requirements of Articles 6(3) and 6(4) of the Habitats Directive have been transposed into Irish legislation by means of Regulations 30 and 33 of the Habitats Regulations, 1997 (S.I. No. 94 of 1997). It is important that Regulations 30 and 33 be interpreted having regard to the Habitats Directive and all relevant national and European case law.

The texts of Articles 6(3) and 6(4) of the Habitats Directive and Regulations 30 and 33 of the Habitats Regulations, 1997, are reproduced in Box 5, Box 6 and Box 7 respectively.

Article 6 (3)

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to *appropriate assessment* of its implications for the site in view of the site’s conservation objectives.

In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

Article 6 (4)

If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and /or a priority species the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion of the Commission, to other reasons of overriding public interest.

Box 5: Text of Articles 6(3) and 6(4) of the Habitats Directive

¹⁶ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

¹⁷ (European Commission 2007a, 3n)

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- (1) Where a proposed road development in respect of which an application for the approval of the Minister for the Environment has been made in accordance with section 51 of the Roads Act, 1993, is neither directly connected with nor necessary to the management of a European site but likely to have a significant effect thereon either individually or in combination with other developments, the Minister for the Environment shall ensure that an appropriate assessment of the implications for the site in view of the site's conservation objectives is undertaken.
- (2) An environmental impact assessment as required under subsection (2) of section 51 of the Roads Act, 1993, in respect of a proposed road development referred to in paragraph (1) shall be an appropriate assessment for the purposes of this Regulation.
- (3) The Minister for the Environment shall, having regard to the conclusions of the assessment undertaken under paragraph (1), agree to the proposed road development only after having ascertained that it will not adversely affect the integrity of the European site concerned.
- (4) In considering whether the proposed road development will adversely affect the integrity of the European site concerned, the Minister for the Environment shall have regard to the manner in which the proposed development is being carried out or to any conditions or restrictions subject to which the approval is given.
- (5) The Minister for the Environment may, notwithstanding a negative assessment and where that Minister is satisfied that there are no alternative solutions, decide to agree to the proposed road development where the proposed road development has to be carried out for imperative reasons of overriding public interest.
- (6)
 - (a) Subject to paragraph (b) imperative reasons of overriding public interest shall include reasons of a social or economic nature;
 - (b) If the site concerned hosts a priority natural habitat type or a priority species, the only considerations of overriding public interest shall be—
 - (i) those relating to human health or public safety,
 - (ii) beneficial consequences of primary importance for the environment, or
 - (iii) further to an opinion from the Commission to other imperative reasons of overriding public interest.

Box 6: *Text of Regulation 30 of the Habitats Regulations, 1997*

Where in accordance with Regulations 27 (5), 28 (5), 29 (4), 30 (5), 31 (5) or 32 (5) an operation or activity is agreed to, notwithstanding a negative assessment of the implications for a European site, the Minister shall ensure that the necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected.

Box 7: *Text of Regulation 33 of the Habitats Regulations, 1997*

App.II.ii Definition of a 'European site'

Article 6(3) and 6(4) of the Habitats Directive only apply in relation to SACs, SPAs and Sites of Community Importance (SCIs).¹⁸ However, it is important to note that the definition of a 'European site' under the transposing regulations includes *proposed* SACs.¹⁹ Notably, however, the definition does not include *proposed* SPAs. Notwithstanding this, it is recommended that a procedure identical to that required under Regulation 30 should be followed in relation to *proposed* SPAs.

App.II.iii General Approach to Appropriate Assessment

The following general approach to appropriate assessment has been derived having regard to the published guidance from the European Commission (2000b, 2001 and 2007a), case law of the European Court of Justice and other relevant material. Project managers and relevant experts involved in the planning of national road projects should be familiar with this material. Recommended reading is outlined in Box 8.

Managing Natura 2000 sites: The provision of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission, 2000b).

Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2001).

Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission (European Commission, 2007a).

Methodological Guideline for Impact Assessment of Transportation Infrastructure Significantly Affecting Natura 2000 Sites (Guideline for IA) Guidance on the provisions of Article 6(3, 4) of the Habitats Directive (Ministry of Transport, Building and Housing of the Federal Republic of Germany, 2004)

Nature and Biodiversity Cases – Ruling of the European Court of Justice (European Commission, 2006).

Box 8: Recommended Reading

It is important to recognise from the outset that the general approach outlined by the European Commission in its guidelines relates to the decision-making flow path for competent authorities, e.g. of An Bord Pleanála. However, it is recommended that those involved in the planning of national road projects should be familiar with the content of these guidelines. As the Commission's guidance is directed at competent authorities, it was necessary to integrate this recommended approach into NRA Project Management Phases. This integration is illustrated in Figure 3, Figure 5 and Figure 7.

¹⁸ (European Commission 2007a, 3n)

¹⁹ See Article 2 of the Habitats Regulations, 1997, as substituted by section 75 of the Wildlife (Amendment) Act, 2000.

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App.II.iii.a Consultation

There should be consultation with National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government at all phases of national road development planning.

App.II.iv Stage 1: Screening

Regulation 30 of the Habitats Regulations, 1997, indicates that appropriate assessment is only required where a project, either individually or in combination with other developments, is likely to have a significant effect on a 'European site'. Therefore, where there is no likelihood of a significant effect a project does not fall within the realms of Regulation 30.

App.II.iv.a The Precautionary Principle

The precautionary principle is a principle of EU law.²⁰ It has been defined as the principle that if an action might cause severe or irreversible harm to the public or to the environment, then in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action (Raffensberger & Tickner, 1999). The ECJ applied the precautionary principle in their interpretation of Article 6(3) when they stated in the *Waddenzee* case that '*any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects.*'²¹ Thus, if it cannot be demonstrated at the screening stage, on the basis of objective information, that the project will not have a significant effect on the site, either individually or in combination with other developments, then an appropriate assessment must be undertaken.

App.II.iv.b Cumulative Effects

It should be noted from the wording of Regulation 30 of the Habitats Regulations, 1997, that it is necessary to consider whether the national road project is likely to have a significant effect alone *or in combination with other developments*. Therefore, it is important to consider all existing developments, as well as all proposed projects or activities which have received the required consent, but are not yet in existence.

App.II.iv.c In the Absence of any Consideration of Mitigation Measures

The Commission has advised:

*[I]t is important to recognise that the screening assessment should be carried out in the absence of any consideration of mitigation measures that form part of a project or plan and are designed to avoid or reduce the impact of a project or plan on a Natura 2000 site.*²²

²⁰ See, generally, European Commission (2000a, p.1)

²¹ C-127/02 *Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij* [2005] 2 CMLR 31, 31

²² (European Commission 2001, p. 14)

Further, the Commission has defined mitigation as:

[M]easures aimed at minimising or even cancelling the negative impact of a plan or project, during or after its completion.²³

However, care is needed to distinguish mitigation measures from elements that would be more correctly defined as forming an integral part of the ‘alternative solution.’ For example, the Commission has indicated that the route, method of construction (e.g. silent piling) and scheduling & timescale proposals may constitute parts of the ‘alternative solution.’ (See Section 3.4.1 generally).

App.II.iv.d Assessment of Significance

It is recommended that the Commission’s Guidance be followed in determining and documenting the likelihood of significant effects. In summary, this involves initially describing the development (and other developments, where cumulative impacts are relevant). Next, the ‘Qualifying Interests’ of the site should be determined and the site’s ‘Conservation Objectives’ should be reviewed. The ‘Qualifying Interests’ are the reasons the site has been designated. In relation to SACs, these will be Annex I habitats and/or Annex II species listed in the Habitats Directive. For SPAs, these will be bird species listed in Annex I and/or referred to in Article 4(2) of the Birds Directive, as well as the habitats of those species of bird. Where they are defined, the ‘Conservation Objectives’ detail the aims for the protection and management of the ‘Qualifying Interests’. The environmental conditions which support site integrity should then be established. The possible impacts on the ‘Qualifying Interests’ or implications for the achievement of the site’s ‘Conservation Objectives’, arising from the development (or other developments where this is relevant), should then be assessed. Finally, there should be an assessment as to whether there is a likelihood of significant effects either alone or in combination with other developments.

So, for example, if the site has been designated due to the presence of a groundwater dependent species listed in Annex II of the Habitats Directive, then this is one of the site’s qualifying interests. The environmental specialist must establish the key environmental conditions which support this species. A possible condition could be the maintenance of the hydrogeological regime, both in terms of quality and quantity of groundwater, supporting this species. It should be considered whether the project has the potential to impact the hydrogeological regime for example, by affecting the aquifer which supplies the European Site. If so, then an assessment as to whether this impact is likely to be significant should be made. If the likelihood of significant impacts cannot be ruled out, then the project should be subject to appropriate assessment.

App.II.iv.e Finding of No Significant Effects Report

Where it is concluded that there are unlikely to be significant environmental effects on the ‘European site’ it is recommended that this be documented in ‘a finding of no significant effects report.’ Such ‘a finding of no significant effects report’ should be made available to all relevant stakeholders, including the public and should be included as an appendix to the EIS.²⁴

²³ (European Commission 2000b, para. 4.5.2); Cf. *Hart District Council v. Secretary of State for Communities and Local Government* [2008] All ER (D) 21 (May)

²⁴ Where an EIS is not being prepared the ‘finding of no significant effects’ report should be included as an appendix to a report prepared pursuant to Part 8 of the Planning and Development Regulations, 2001 (S.I. No. 600 of 2001), as appropriate

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App.II.iv.f **Application of Article 6(3) screening in relation to national road projects**

In terms of the planning of national road projects, Article 6(3) screening should be carried out in relation to all route corridors being considered at RCS (see Figure 5) and in relation to the Preliminary Design during the Preliminary Design/EIA phase (see Figure 7).

App.II.v **Stage 2: Appropriate Assessment**

Appropriate assessment involves the consideration of the impact of the national road project on the integrity of the European site, either alone or in combination with other projects or plans, with respect to the European site's structure and function and its conservation objectives (See Section 3.4.4 concerning 'determining impact significance' which defines terms such as 'integrity,' 'conservation status,' etc.). Additionally, where there are adverse impacts, appropriate assessment involves an assessment of the potential mitigation of those impacts.

Again, the precautionary principle flows through the appropriate assessment procedure. The *Waddenzee* case highlights the need for '*best scientific knowledge in the field*' in appropriate assessment.²⁵ It is, therefore, important that ecologists with sufficient training, expertise and knowledge in the relevant areas are employed in the appropriate assessment of national road development projects.

Waddenzee also highlights that the onus of proof is on the project proponent to demonstrate whether the project is not having an adverse affect. Additionally, *Waddenzee* indicates that the burden of proof is high, suggesting that where 'reasonable scientific doubt' remains, then a negative assessment must be presumed.²⁶

In relation to the planning of national road development projects, appropriate assessment will be required at the EIA stage where the likelihood of significant effects on a European site, either alone or in combination with other development, cannot be disproved (see Figure 7). At RCS stage it will be necessary for national road developers to determine, as far as it is practicable to determine at this stage, whether any of the feasible route corridors adversely affect the integrity of the European site, either alone or in combination with other developments, where the likelihood of significant effects on a European site cannot be disproved for the respective route corridors (see Figure 5). This latter assessment is not an appropriate assessment as it is made by the developer and not the competent authority. However, the same principles and guidance should apply in making the determination.

Appropriate assessment will involve the gathering and consideration of information from many sources. Communication with other members of the National Road design team is extremely important. Consultation with National Parks and Wildlife Service should be undertaken. Ecological interest groups, such as BirdWatch Ireland, Bat Conservation Ireland, Coast Watch, Irish Peatland Conservation Council, Irish Wildlife Trust, may be useful sources of information and expert opinion.

²⁵ C-127/02 *Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij* [2005] 2 CMLR 31, 31

²⁶ *Ibid* at 31

App.II.v.a Who carries out the Appropriate Assessment?

The European Commission guidance (EC, 2001) states ‘*it is the competent authority’s responsibility to carry out the appropriate assessment.*’ In the case of national road projects the competent authority is An Bord Pleanála.²⁷ It is in fact the Board who carry out the appropriate assessment. Notwithstanding this, the reports which form the basis for this assessment should be prepared by the proponent of the national road project. It is therefore recommended that any information within an EIS being provided in relation to an appropriate assessment specifically state that this information is being provided to assist An Bord Pleanála in performing an appropriate assessment pursuant to Regulation 30 of the Habitats Regulations, 1997.

App.II.v.b Format of the Appropriate Assessment

When an appropriate assessment is required, the question arises as to the format in which the road developer should provide finalised information to the competent authority. Regulation 30(2) of the Habitats Regulations, 1997, provides ‘*An environmental impact assessment as required under subsection (2) of section 51 of the Roads Act, 1993, in respect of a proposed road development referred to in paragraph (1) shall be an appropriate assessment for the purposes of this Regulation.*’ Thus, it is entirely acceptable that information provided by the road project developer pursuant to a Regulation 30 appropriate assessment should be contained within the EIS. Having regard to the Commission’s guidance on this matter,²⁸ this information should be clearly distinguishable from other elements of the EIS. It is recommended that the information should preferably be contained within an Appendix to the EIS and cross-referenced to the main text.

App.II.vi Stage 3: Overriding Public Interest and the Assessment of Alternative Solutions

Article 6(4) of the Habitats Directive (see Regulation 30(5) of the Habitats Regulations, 1997) states that in spite of a ‘*negative assessment of the implications for the site,*’ and where an ‘*absence of alternative solutions*’ exists, a project may still be granted consent where it ‘*must nevertheless be carried out for imperative reasons of overriding public interest.*’ In essence, in order to grant consent for a national road development project which adversely affects the integrity of a European site, the competent authority, An Bord Pleanála, must decide that imperative reasons of overriding public interest (IROPI) exist (see Section App.II.vi.a) and that there is an absence of alternative solutions (see Section App.II.vi.b). National road developers will require an understanding of these concepts during RCS (see Section 5.2) and EIA phases (see Section 6.2).

App.II.vi.a An Introduction to Imperative Reasons of Overriding Public Interest (IROPI)

As will be seen in Section App.II.vi.b, IROPI are also considered in assessing alternative solutions.

²⁷ Regulation 30 of the Habitats Regulations, 1997, (S.I. No. 94 of 1997); Regulation 4 of the Environment (Alteration of Name of Department and Title of Minister) Order, 1997 (S.I. No. 322 of 1997); Section 215 of the Planning and Development Act, 2000

²⁸ (European Commission 2001, Section 2.4)

‘the assessment required by Article 6 should be clearly distinguishable and identified within an environmental statement or reported separately.’

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IROPI are deemed to exist when reasons of public interest in carrying out the project can imperatively override the protection of a European site.²⁹ Whilst each case is judged on its own merits, the following guiding principles may be relevant in deciding whether IROPI are demonstrated (Scottish Government, 2000):

- a need to address a serious risk to human health and public safety;
- national security and defence considerations; or
- a clear and demonstrable direct environmental benefit on a national or international scale; or
- a vital contribution to strategic economic development or regeneration; or
- where failure to proceed would have unacceptable social/economic consequences.

It is extremely important to note that the elements which constitute IROPI may depend on whether the habitats or species affected are *priority* or not (see Article 6(4) of the Habitats Directive and Regulation 30(6) of the Habitats Regulations, 1997). ‘Priority natural habitat types’ means natural habitat types in danger of disappearance; these priority natural habitat types are indicated by an asterisk (*) in Annex I of the Habitats Directive.³⁰ ‘Priority species’ are endangered species or those at the edge of their geographic range; these priority species are indicated by an asterisk (*) in Annex II of the Habitats Directive. It should be noted, however, that none of the species listed as priority in Annex II of the Habitats Directive are known to occur in Ireland. Where priority habitat types are affected, then IROPI can only relate to human health or public safety, or to beneficial consequences of primary importance for the environment, unless the European Commission has forwarded its Opinion identifying other IROPI.³¹ If no priority habitats are affected, then IROPI may also include, *inter alia*, social or economic considerations.

For a fuller understanding of the concept of IROPI the following documents should be consulted:

- *Guidance document on Article 6(4) of the ‘Habitats Directive’ 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission* (European Commission, 2007a); and
- “European Commission’s Opinions under Article 6(4) of the Habitats Directive” (Kramer, 2009).

App.II.vi.b Assessment of Alternative Solutions

In relation to national road developments, the Commission (2001, p.35) states that alternative solutions may be composed of, *inter alia*, alternative:

- routes;
- methods of construction; and
- scheduling and timescale proposals.

It should be noted that a national road developer will consider alternative solutions during both the RCS and EIA phases (see Sections 5.2 and 6.2).

²⁹ See the Opinion of Advocate General Kokott delivered on the 27th of April, 2006, in relation to Case C-239/04 *Commission of the European Communities v. Portuguese Republic* Para. 45.

³⁰ Article 1(d) of the ‘Habitats Directive.’

³¹ The Commission have provided a number of Opinions under Article 6(4), including: Commission Opinion (EC) 96/15 of 18 December 1995 [1996] OJ L6/14; Commission Opinion (EC) of 27 April 1995 [1995] OJ C178/3; Commission, C(2000) 1079 of 14 April 2000; Commission, C(2003) 1303 of 24 April 2003; Commission, C(2003) 1304 of 24 April 2003; Commission, K(2003) 1309 of 24 April 2003; Commission, C(2004) 3460 of 17 September 2004; Commission, C(2004) 1797 of 14 May 2004; Commission K(2005) 1641 of 6 June 2006; and Commission, C(2006) 5190 of 6 November 2006.

The phrase ‘absence of alternative solutions’ could be interpreted as requiring that the infinite number of alternative solutions, feasible and unfeasible, be assessed. However, only feasible alternative solutions should be assessed (European Commission, 2007a, p.4), with manifestly unfeasible alternative solutions needing no further examination.³² Of the feasible alternative solutions, Kramer (2009) states, ‘*It simply does not make sense to ask for an examination of all of them, with an environmental impact assessment made for each of them.*’ Therefore, only reasonably alternative solutions representative of the infinite number of feasible alternative solutions should be assessed. It is important that this assessment is documented. In essence, the notion of ‘*absence of alternative solutions*’ in Article 6(4) of the Habitats Directive and in Regulation 30(5) of the Habitats Regulations, 1997, has to be read as meaning ‘*absence of reasonably alternative solutions*’ (Kramer, 2009).

In the ‘Castro Verde’ case, Advocate General Kokott stated that the alternative solution selected does not ‘*inevitably have to be determined by which alternative least adversely affects the site concerned.*’³³ Instead, she suggests ‘*the choice requires a balance to be struck between the adverse effect on the integrity of the [European site] and the relevant reasons of overriding public interest.*’³⁴ The Advocate General continues ‘*The decisive factor is therefore whether imperative reasons of overriding public interest require the implementation of specifically that alternative or whether they can also be satisfied by another alternative with less of an adverse effect on the [European site].*’³⁵

The following points may be derived from: Advocate General Kokott’s Opinion in the ‘Castro Verde’ case; relevant ECJ case law; European Commission guidance; and relevant academic literature:

1. It is important to ensure that there has been sufficient examination of feasible alternative solutions and that this examination has been documented;
2. Where feasible alternative solutions exist which would not have an adverse effect on the integrity of a European site, then any feasible alternative solutions which do should not be considered further;
3. Where there are no feasible alternative solutions which would not have an adverse effect on the European site, then strong consideration should be given to choosing the feasible alternative solution which has the least adverse effect on the European site;
4. Where the IROPI requires the choice of a feasible alternative solution other than that having the least effect only then may the feasible alternative solution having least effect not be chosen.

The importance of demonstrating that there has been sufficient examination of feasible alternative solutions and documenting this examination during these phases is highlighted. Where feasible alternative solutions exist which do not have an adverse effect on the integrity of a European site, then those which do should be eliminated. Where no feasible alternative solutions exist which do not adversely affect the integrity of a European site, then priority should be given to the feasible alternative solution having the least adverse impact. It is only in exceptional circumstances that

³² C-239/04 *Commission of the European Communities v. Portuguese Republic* Para. 38.

³³ Opinion of Advocate General Kokott delivered on the 27th of April, 2006, in relation to Case C-239/04 *Commission of the European Communities v. Portuguese Republic* Para. 44.

³⁴ Opinion of Advocate General Kokott delivered on the 27th of April, 2006, in relation to Case C-239/04 *Commission of the European Communities v. Portuguese Republic* Para. 44.

³⁵ Opinion of Advocate General Kokott delivered on the 27th of April, 2006, in relation to Case C-239/04 *Commission of the European Communities v. Portuguese Republic* Para. 46.

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IROPI will dictate the choice of a feasible alternative solution that does not have the least adverse impact. The principle of proportionality should be applied.

App.II.vii Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain

Regulation 33 of the Habitats Regulations, 1997, states that where a national road development is agreed to, notwithstanding a negative assessment of the implications for a European site, the competent authority, An Bord Pleanála, ‘*shall ensure that the necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected.*’

ATECMA (2005), in its *Study to provide guidelines for application of compensatory measures under Article 6(4) of the Habitats Directive 94/43/EEC*, state compensatory measures:

1. involve independent actions intended to offset the negative effects of the plan or project that would remain owing to the limited effectiveness of mitigation, so that the overall ecological coherence of the Natura 2000 network is maintained;
2. are an option when residual impacts of a plan or project are still deemed significant after relocation, redesign or mitigation options have been implemented; and
3. are independent measures adopted to offset these impacts.

Compensatory measures may include (European Commission, 2007, p.14):

1. Restoration or enhancement in existing sites; and/or
2. Habitat recreation in existing or new sites.

If compensatory measures are required, significant time and expert advice will be required by the project planning team to ensure that the measures are adequate and are properly planned and implemented. Some guidance on ecological restoration and creation of habitats is given in Gilbert and Anderson (1998).

In designing and assessing compensation measures, establishing implementation procedures, and designing monitoring plans, consultation with the National Parks and Wildlife Service is required.

APPENDIX III DEROGATION LICENSING PROCEDURES IN RELATION TO PROTECTED SPECIES

As indicated in Section 1.6 the Authority has published *Ecological Surveying Techniques for protected flora and fauna during the planning of National Road Schemes* (the ‘Survey Guidelines’) (National Road Authority, 2008b), which supplement these guidelines by providing advice on procedures and survey techniques for rare and protected habitats and species.

Special consideration must be given in the planning of national road schemes to any species of flora or fauna that are protected by national or international legislation or that are considered to be rare in a national or international context. Legally protected flora or fauna are normally specified in a schedule or Annex to the legislation. The main legal instruments for the protection of species are listed in Appendix III of the ‘Survey Guidelines’.

In some cases, a licence may be required to remove, or disturb the habitat of, these protected species. The principal licensing authority is the Department of Environment, Heritage and Local Government.

App.III.i Derogation licences

The European Court of Justice has indicated that the practice of requiring information on protected species only after development consent has been granted undermines the EIA process.³⁶ In order to rectify this situation the Department of Environment, Heritage and Local Government has advised that ‘[a]n application for [a derogation licence] should be made in advance of seeking any necessary approval for development/planning permission for works. This will ensure that full consideration can be given to the impacts of the proposed project on the species and to avoid the possibility of delay to the proposed project or of a refusal of a derogation licence which would prevent the works being carried out as planned.’³⁷ Therefore, it is recommended that, where feasible, derogation licences be applied for in advance of the granting of EIA consent. Whilst this is particularly the case in relation to species protected under EU law, e.g. species protected under Annex IV (A) of the Habitats Directive requiring a derogation licence pursuant to Regulation 25 of the Habitats Regulations, 1997,³⁸ this recommendation also applies in relation to species protected under national legislation such as the Wildlife Acts, 1976 and 2000.

App.III.i.a Regulation 25 Derogation Licences

Readers are directed to *Guidance document on the strict protection of animal species of Community interests under the Habitats Directive 92/42/EEC* (European Commission, 2007b) for more detailed information on Regulation 25 derogation licences.

³⁶ Case C-183/05 *Commission of the European Communities v. Ireland* [2007] ECR I-0000 para. 51

³⁷ (Department of the Environment, Heritage and Local Government, 2008d)

³⁸ See, generally, (European Commission, 2007b)

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Regulation 23(3) of the Habitats Regulations, 1997, provides:

A person who in respect of the species set out in Part I of the First Schedule—

- (a) deliberately captures or kills any specimen of these species in the wild,*
- (b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,*
- (c) deliberately takes or destroys the eggs from the wild, or*
- (d) damages or destroys a breeding site or resting place of such an animal,*

shall be guilty of an offence.

Part I of the First Schedule of the Habitats Regulations, 1997, lists all species specified in Annex IV (A) of the Habitats Directive.³⁹ Regulation 25 of the Habitats Regulations, 1997, allows the Minister for Environment, Heritage and Local Government to permit derogation from complying with the provisions of Regulation 23. Regulation 25(1) of the Habitats Regulations, 1997, may be broken down into the following three tests:⁴⁰

- 1) the demonstration of one or more of the reasons listed in Regulation 25(1) (a)-(e);*
- 2) the absence of a satisfactory alternative; and*
- 3) the assurance that a derogation is not detrimental to the maintenance of populations at a favourable conservation status.*

It is apparent that the tests here are similar/analogous to those applied in relation to Article 6(4) of the Habitats Directive. Appropriate regard should, therefore, be had to Appendix II and Sections 4.3.3, 5.2 and 6.2 in the planning of national road projects and in the making of Regulation 25 derogation licence applications. The three tests are outlined in more detail below.

Test One: of one or more of the reasons listed in Regulation 25(1) (a)-(e)

Given that the ECJ has indicated that the grounds for derogation should be construed narrowly, generally the primary ground under which a national road scheme may be granted a derogation is under Regulation 25(1)(c), namely: ‘*in the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment.*’ Section App.II.vi.a should be consulted for a fuller understanding of the concept of imperative reasons of overriding public interest (IROPI).

Test Two: Absence of a satisfactory alternative

Regulation 25(1) requires that there be an absence of a satisfactory alternative. Again, whilst Appendix II and Sections 4.3.3, 5.2 and 6.2. deal specifically with Articles 6(3) and 6(4) of the Habitats Directive/Regulations 30 and 33 of the Habitats Regulations, 1997, these sections contain useful information on this test.

³⁹ Regulation 3(12) of the European Communities (Natural Habitats) (Amendment) Regulations, 2005
⁴⁰ (European Commission 2007b, p. 54)

Test Three: Not detrimental to the maintenance of populations at a favourable conservation status

Regulation 25(1) provides that the granting of the derogation licence must not be detrimental to the maintenance of populations at a favourable conservation status. The conservation status of all EU protected habitats and species is outlined in DoEHLG's (2008a) *The Status of EU Protected Habitats and Species in Ireland*. This document indicates that many habitats and species are not currently at favourable conservation status. Thus, the question arises whether or not the granting of a derogation licence can be justified in such circumstances. In this regard the Commission suggest that '*the less favourable the conservation status and trends, the less likely will the granting of derogations be justified apart from in the most exceptional circumstances.*'⁴¹ However, the Commission also suggest that '*[c]ompensation measures may, under certain circumstances, be used to offset the impact of a derogation on breeding sites and resting places...*'⁴²

⁴¹ (European Commission 2007b, p. 65)

⁴² Ibid at 65

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**APPENDIX IV DAMAGE TO PROTECTED HABITATS AND SPECIES: THE ENVIRONMENTAL
LIABILITY DIRECTIVE**

App.IV.i Introduction

As of April, 2009, Ireland is in the process of preparing legislation to transpose the Environmental Liability Directive (ELD).⁴³ The European Communities (Environmental Liability) Regulations, 2008 (S.I. No. 547 of 2008) ('Environmental Liability Regulations'), were published in *Iris Oifigiúil* of the 23rd of December, 2008. The Environmental Liability Bill is listed in Section A ('Bills expected to be published from the start of the Dáil Session up to the beginning of the next Session') of the Government Legislation Programme.⁴⁴

The following guidance is written having regard to the contents of the ELD, and to existing and proposed transposing measures and associated documentation.⁴⁵

The Environmental Liability Directive specifies that Member States should, *inter alia*, establish a civil liability regime whereby operators of specified activities which cause environmental damage are financially liable for remedying this damage. The Directive also aims to hold those responsible for certain activities which have caused an imminent threat of environmental damage liable for taking preventive actions.

⁴³ Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage

⁴⁴ <http://www.taoiseach.gov.ie/index.asp?docID=2579>

⁴⁵ See *Environmental Liability Directive – Screening Regulatory Impact Analysis* (DoEHLG, 2008b); *Guidance – Draft Legislation transposing the Environmental Liability Directive* (DoEHLG, 2008c)

App.IV.ii Environmental Damage

A significant feature of the Directive is that it defines ‘environmental damage’ as damage to protected species and natural habitats, ‘water damage’⁴⁶ and ‘land damage.’⁴⁷ In the context of damage to protected species and natural habitats, damage occurs where there is a significant adverse effect on reaching or maintaining the favourable conservation status of such habitats or species.

App.IV.iii Species and Habitats Protected

The species and habitats protected under the ELD include the following:

- Species of bird, listed in Annex I and referred to in Article 4(2) of the Birds Directive;⁴⁸
- Species of animals and plants listed in Annex II and IV of the Habitats Directive;⁴⁹
- Habitats of species of bird, listed in Annex I and referred to in Article 4(2) of the Birds Directive;
- Habitats of species of animals and plants identified in the Habitats Directive (listed in Annex II);
- Natural habitats listed in Annex I of the Habitats Directive; and
- The breeding sites or resting places of the species, listed in Annex IV of the Habitats Directive.

The proposed Bill also provides that the Minister for the Environment, Heritage and Local Government may, by way of Regulation, extend the species and habitats protected to include those other species or habitats protected under the Wildlife Acts and Habitats Regulations.⁵⁰ It is important to note that the protection regime applies to protected habitats and species both inside and outside of European sites.

App.IV.iv Assessment of Damage to Protected Species and Habitat

Schedule I to the Environmental Liability Regulations outlines the proposed criteria in assessing damage to protected species and habitat. The schedule states:

The significance of any damage that has adverse effects on reaching or maintaining the favourable conservation status of habitats or species has to be assessed by reference to the conservation status at the time of the damage, the services provided by the amenities they produce and their capacity for natural regeneration.

⁴⁶ Regulation 2(1) of the Environmental Liability Regulations defines “water damage:”
“water damage” means any damage that significantly adversely affects the ecological, chemical or quantitative status or ecological potential, as defined in the Water Framework Directive, of the waters concerned, with the exception of adverse effects where Article 4(7) of the Water Framework Directive applies;

⁴⁷ Regulation 2(1) of the Environmental Liability Regulations defines “land damage:”
“land damage” means any land contamination that creates a significant risk of human health being adversely affected as a result of the direct or indirect introduction, in, on or under land, of substances, preparations, organisms or micro-organisms;

⁴⁸ Council Directive of 2 April 1979 on the conservation of wild bird (79/409/EEC)

⁴⁹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

⁵⁰ Head 3 – Extension of Habitats and Species

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The Schedule further indicates that significant adverse changes to the baseline condition should be determined by means of measurable data, such as:

- ❑ the number of individuals, their density or the area covered;
- ❑ the role of the particular individuals or of the damaged area in relation to the species or to the habitat conservation, the rarity of the species or habitat (assessed at local, regional and higher level including at Community level);
- ❑ the species' capacity for propagation (according to the dynamics specific to that species or to that population), its viability or the habitat's capacity for natural regeneration (according to the dynamics specific to its characteristic species or to their populations); and
- ❑ the species' or habitat's capacity, after damage has occurred, to recover within a short time, without any intervention other than increased protection measures, to a condition which leads, solely by virtue of the dynamics of the species or habitat, to a condition deemed equivalent or superior to the baseline condition.

App.IV.v Permit Defences

Article 2(1)(a) of the ELD states:

Damage to protected species and natural habitats does not include previously identified adverse effects which result from an act by an operator which was expressly authorised by the relevant authorities in accordance with provisions implementing Article 6(3) and (4) or Article 16 of Directive 92/43/EEC or Article 9 of Directive 79/409/EEC or, in the case of habitats and species not covered by Community law, in accordance with equivalent provisions of national law on nature conservation.


This provision has the effect of providing a “permit defence.” So, for example, the holding of a derogation licence under Regulation 25 of the Habitats Regulations, 1997, (the provision transposing Article 16 of Directive 92/43/EEC) may exempt the holder from liability in relation to environmental damage to the Annex IV (A) species in question. Similarly, a development consent or approval given by An Bord Pleanála in circumstances where the development concerned is subject to EIA and the EIA is an appropriate assessment for the purposes of the Habitats Regulations, 1997, may exempt the development from liability in relation to environmental damage on a European site. Such possible exemption from liability is, of course, subject to the conditions of licences or consent being complied with.

APPENDIX V LOCAL AUTHORITY WORKS AFFECTING NATURE RESERVES, NATURE REFUGES AND NATURAL HERITAGE AREAS (NHAS)

Scannell (2006, p. 282) indicates that the Wildlife Acts provide, *inter alia*, that a local authority and other defined public authorities, shall: (1) consult with the Minister for the Environment, Heritage and Local Government before anything which (in the opinion of the Minister, other Minister or the authority/body in question) is likely or liable to affect, or to interfere with a Nature Reserve, Nature Refuge or Natural Heritage Area; and (2) take all practicable steps to avoid or minimise such effect or interference.⁵¹

⁵¹ Section 12 of the Wildlife Act, 1976, and Section 24(1) of the Wildlife (Amendment) Act, 2000.



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