VOLUME 11 SECTION 3 PART 4
ECOLOGY & NATURE CONSERVATION

CONTENTS

Volume 11 home page

1. INTRODUCTION

1.1 Ecology is the scientific study of living organisms, and their relationship both with each other and their environment (eg soils, climate, topography). Nature conservation is concerned with maintaining a viable population of the country's characteristic fauna and flora and the communities they comprise. The objectives for nature conservation are:

- the maintenance of the diversity and character of the countryside, including its wildlife communities and important geological and physical features;

- the maintenance of viable populations of wildlife species, throughout their traditional ranges, and the improvement of the status of rare and vulnerable species.

1.2 Conservation of wildlife species and their habitats is important both for human inspiration, enjoyment and general well-being and to sustain the value of the natural environment for future generations as an asset for recreation, education and direct economic benefit including genetic resources.

1.3 It should be noted that all references to `the (relevant) statutory bodies' in this part apply equally to English Nature (EN), the Countryside Council for Wales (CCW), Scottish Natural Heritage (SNH) and the Northern Ireland Environment Service : Countryside and Wildlife (ES : CW) unless otherwise stated.

2. THE STATUTORY BODIES

ENGLISH NATURE

2.1 English Nature (EN) is the Government funded body responsible for promoting nature conservation in England. It replaced the Nature Conservancy Council in England in April 1991. Its aims are to maintain and enhance viable populations of the characteristic flora and fauna of the country, over their traditional ranges. EN provides advice to Government on the development and implementation of policies for, or affecting, nature conservation. It selects, establishes and manages National Nature Reserves (NNRs), and identifies and notifies Sites of Special Scientific Interest (SSSIs). It is responsible for considering applications and issuing licences to disturb or move protected species. It provides advice and disseminates information about nature conservation, and supports and conducts research relevant to these functions. EN also works on UK and international nature conservation issues, in conjunction with the Joint Nature Conservation Committee (JNCC).

SCOTTISH NATURAL HERITAGE

2.2 Scottish Natural Heritage (SNH) has a similar but wider role to EN, which is to secure the conservation and enhancement of Scotland's natural heritage of wildlife and landscape. SNH provides advice to Government on landscape and recreation issues in Scotland and has a duty to ensure that anything done in relation to natural heritage is in a manner which is sustainable. SNH also works on UK and international nature conservation issues, in conjunction with the Joint Nature Conservation Committee (JNCC).

COUNTRYSIDE COUNCIL FOR WALES

2.3 The CCW is the government's statutory advisor on wildlife and countryside conservation matters in Wales. It is the executive authority for the conservation of habitats and wildlife. Through partners it promotes the protection of landscape, opportunities for enjoyment, and the support of those who live and work in, and manage, the countryside. It enables these partners, including local authorities, voluntary organisations and interested individuals to pursue countryside management projects through grant-aid.

THE ENVIRONMENT SERVICE : COUNTRYSIDE AND WILDLIFE, NORTHERN IRELAND

2.4 In Northern Ireland the Environment Service: Countryside and Wildlife, of the Department of the Environment for Northern Ireland (ES : CW) is responsible for promoting nature conservation. It has broadly similar functions to that of English Nature in that it establishes and manages National Nature Reserves (NNRs) and declares Areas of Special Scientific Interest (ASSIs). Furthermore it has an advisory function to other branches of Government on matters related to nature conservation and holds extensive data on sites and species on which such advice is based.

2.5 The statutory bodies have two main roles in relation to trunk road schemes, those of advisor and consultee. They are the statutory point of contact for all scheme related ecological and conservation issues.

2.6 Consulting the statutory bodies in the early stages of a scheme's development may help to avoid or minimise potential conservation problems and assist in choice of alignment. Consultation should continue throughout the design phase through to construction and management, where relevant. Advice should be sought from the statutory bodies on a wide range of issues including scoping of surveys, possible impacts and mitigation measures.

2.7 In England and Wales section 105A of the Highways Act 1980, and in Scotland by sections 20A and 55A of the Roads (Scotland) Act 1984, stipulates that, for any scheme passing through or within 100m of an SSSI, the statutory bodies must be given the opportunity to express an opinion, (ie comment on the published Environmental Statement before the project is initiated).

2.8 Statutory bodies are also required to give information to the Overseeing Department or its Design Organisation during the preparation of the Environmental Statement. In England, in recognition of EN's wider role as the Government's advisor, it has been agreed that copies of the relevant sections of all Environmental Statements should be sent to EN, who will comment where appropriate. In Northern Ireland Article 39B of the Roads (Northern Ireland) Order 1980 requires the Environmental Assessment of certain road projects. Copies of all Environmental Statements should be sent to ES : CW who will comment where appropriate.

2.9 The statutory bodies also hold extensive data on the location and nature of designated sites, the existence of specialist studies and surveys (including those carried out by other organisations), methods of habitat restoration and enhancement and many other subjects. Any queries on nature conservation issues should therefore be directed to them.

Other Sources of Advice and Information

2.10 There are various environmental organisations, in addition to the statutory bodies, who are able to supply the specialist advice and information which may be required for an ecological assessment. A list of names and addresses of such bodies can be found at ANNEX I of this chapter. The list covers the most widely known organisations, and gives a brief description of their area of expertise. Where expert advice is required on areas not covered by the list, the statutory bodies can provide details of suitable specialists.

2.11 In the stages of scheme development before Stage 3, the statutory bodies should be able to provide the requisite levels of advice on conservation issues. However, it should be noted that they are not required to carry out research in connection with an environmental assessment, but simply to provide information in their possession.

2.12 Where the Overseeing Department's Project Manager deems it necessary, other environmental groups may be approached for information about the presence, absence or distribution of species over a given area prior to Stage 3. However, the Overseeing Department's Project Manager's permission **must** be sought before any approach is made and it must be made clear that this is a request for information and not a formal consultation. **Care must also be taken not to disclose the details of route options** in order to minimise possible blight problems.

3. DESIGNATED SITES

3.1 Designated sites are areas of high nature conservation value which are protected to varying degrees by statute, international conventions, or local authority planning controls. They form a network of habitats which may be of global, international, European, national, regional or local importance. Generally, the priority for protection of designated sites is as follows:

a) global/international/European/ national sites
b) regional or local sites
c) other wildlife sites

3.2 The extent of protection afforded by individual designations varies considerably. Sites of Special Scientific Interest (SSSIs), for example, have some legal protection under the Wildlife and Countryside Act 1981 (see ANNEXES III and IV), against operations which might damage their interest (details are set out in the English Nature publication 'What you should know about Sites of Special Scientific Interest' 1992). In some cases the proscribed operations (potentially damaging operations) may be carried out under certain conditions. Failure to adhere to these conditions can result in the landowner or occupier facing prosecution. The protection afforded to sites by local authority designations, by comparison, is normally minimal. Such designations are mostly for planning purposes only, and while a local authority may have a stated policy of avoiding development in these areas, there is no statutory protection process.

3.3 The designation SSSI (or ASSI in Northern Ireland) covers areas considered by the statutory bodies to be of national or international importance (including geological and physiographical features which are discussed in Part 11). It is the Government's policy, wherever possible, to keep roads away from protected areas such as SSSIs (1987 Roads White Paper, paragraph 5.1).

3.4 There are a number of other protected habitats these are discussed in ANNEX IV.

4. NON-DESIGNATED AREAS

4.1 It is important to remember that the network of designated sites is not necessarily comprehensive. The list of SSSIs, for example, is constantly being reviewed to assess the state of sites in relation to the overall resource. This can lead to denotification of damaged sites and notification of substitute sites if available. ANNEX V sets out a range of features which are indicative of potential conservation value and which, if present, should be considered.

4.2 The nature conservation value of any site (whether it is designated or not) will depend on the extent to which it meets a number of scientific criteria. These criteria are detailed in `Guidelines for Selection of Biological SSSIs', (Nature Conservancy Council 1989 and `Guidelines for Selection of Biological SSSIs : non vascular plants (Joint Nature Conservation Committee, 1992)). For an assessment of general wildlife value the Ratcliffe criteria can be used. These criteria are the attributes listed by Ratcliffe in 1977, as part of work carried out for the then Nature Conservancy Council, in relation to SSSIs. The criteria are discussed in more detail in ANNEX VI.

4.3 It is also important to consider the overall ecological value of the area through which a road may run, since designation tends to be site specific, often covering relatively small areas. Many species have large and fluctuating territories which range beyond site boundaries and respond in a dynamic way to changes in conditions. Examples of this include programmes, run by statutory bodies and others, to encourage the recovery of rare, or protected species such as barn owls, dormice, sea eagles, red kites and otters, whose numbers have declined in recent decades. Habitat improvement and carefully planned and monitored releases of individuals bred in captivity are used to try to return such species to their traditional ranges. It is essential that consultations with EN, SNH, CCW, the Hawk and Owl Trust, the RSPB or the RSNC and local Wildlife Trusts include requests for information on any recovery projects which could be affected by proposed schemes.

4.4 In addition, areas designated primarily for their landscape value such as Areas of Outstanding Natural Beauty (AONBs), National Parks, National Scenic Areas in Scotland and Environmentally Sensitive Areas (ESAs) may, by virtue of their natural qualities, support a wide range of habitats and associated wildlife. Insensitive siting of a route in an area of overall high wildlife value may have wide ranging impacts, extending well beyond the vicinity of the road. Therefore, the pattern of habitat in the wider countryside and the interdependencies between habitats must also be taken into account.

5. POTENTIAL IMPACTS OF ROAD SCHEMES ON NATURE CONSERVATION

5.1 The range of potential nature conservation impacts of road schemes, and their significance, will depend on the individual circumstances of each scheme. However, it is possible to identify a number of main areas of concern, which have general applicability. These are set out below:

(a) direct loss of wildlife habitats through land-take. It may be necessary, in some cases, to make a choice between taking land from two different but important habitat types. The views of the relevant statutory body should be sought before a route option is recommended;

(b) severance, where a scheme may create a barrier and divide existing habitats or wildlife corridors (eg hedgerows). Smaller areas of land may be more vulnerable to loss, damage or change, and may be unable to continue to support their original number and diversity of species;

(c) creatures may be killed trying to cross a road which cuts across their traditional territory or foraging routes. For example badgers, being creatures of habit, will generally continue to travel along established runs, regardless of the presence of a new road, unless prevented from doing so. Some birds, such as barn owls, are known to hunt along roadside verges and are therefore at risk from traffic. Breeding amphibians may also be vulnerable if a new road separates the animals' day-to-day habitat from their traditional breeding ponds;

(d) disruption to the local hydrology. For wetland sites (including marshes, bogs, flushes, mires, stream and river banks, open water and damp semi-natural grassland), disruption to the drainage pattern, as a result of construction may cause damage to the existing ecology. Changes in the flow and volume of sub-surface water may have equally important effects. Resultant impacts can be highly localised or affect habitats some distance away from the scheme (See also Part 10, Chapter 4);

(e) polluted run-off from roads can lead to pollution of local watercourses through oil, de-icing salt, particulates and accidental spillages. The volume of run-off also needs consideration to avoid overloading the capacity of watercourses, particularly during storms (See also SECTION 3, PART 10, CHAPTER 4);

(f) road structures may cause problems for certain birds and mammals. Large waders and flocks of wildfowl, in particular, prefer open expanses for their feeding and roosting sites, as this allows them to see predators more easily. Structures such as bridges or viaducts, which reduce visibility may therefore make a site unattractive to these birds.

(g) effects of road lighting - road lighting can adversely affect invertebrates and disorientate birds. It can also affect birds' feeding patterns (by simulating daylight), although whether this will have beneficial or adverse consequences will vary according to circumstances;

(h) air pollutants from road traffic may have effects on local habitats and species, although specific impacts are, as yet, poorly documented. However, certain ferns and lichens are particularly vulnerable to elements of vehicle emissions. Lead pollution can cause replacement of native communities by lead tolerant species, and more generally, particulates settling on plants can impair photosynthesis;

(i) spray from road traffic - most spray is deposited near to the carriageway. Spray which has a high concentration of salt is most harmful, although research (TRRL Laboratory Report 1061) has suggested that, on verges 5m from the hard shoulder, the concentration of salt in the soil is a negligible hazard to many plants. Exceptions to this may be more sensitive and specialised species which can only be grown within a small range of chemical tolerances. Small droplets of spray may be blown further afield, and in harsh winters, severe browning

Volume 11 home page

of Scots pine and spruce has been noted up to 15m from the carriageway. Saline conditions can also build up, in the longer term, in the 2m verge leading to the development of plant communities which are either salt tolerant or characteristic of salt marshes. Spray damage is usually unsightly rather than life-threatening to plants, although it may have adverse effects on sensitive habitats containing communities or populations of plants with specialised requirements. In general, spray damage is more likely to affect evergreen trees and shrubs which will be in leaf when de-icing takes place;

(j) disturbance during construction - although construction works are temporary, they can still lead to disturbance and pollution if sufficient care is not taken. If it is felt that there is a need to protect sensitive water courses or areas of vegetation, this can be specified in the contract.

6. MITIGATION OF ADVERSE ECOLOGICAL EFFECTS

6.1 Assessment and design are parts of an iterative process which together suggest potential mitigation measures which can be adopted. The incorporation of specific mitigation measures into a scheme should not be assumed in subsequent assessments without the agreement of the Overseeing Department's Project Manager. At each Stage, assumptions about mitigation measures should be stated in the factual reports on assessment.

6.2 Advice on the environmental design of roads, including mitigation measures, is set out in DMRB 10. The following examples illustrate some of the measures which may need to be considered for incorporation into the design of a scheme:

(a) Route alignment - to avoid loss and/or severance of particularly sensitive areas such as SSSIs or disturbance during construction.

(b) Bridges and Viaducts - to reduce adverse effects on wetland habitats, where water levels could be altered by embankments. Large culverts may also have a dual function in maintaining wildlife corridors (eg for otters and badgers).

(c) Drainage - careful design is important to minimise changes to local hydrology. Balancing ponds may reduce the risk of pollution from surface run-off and provide additional capacity to cope with storm water. If over-deepened to provide a permanent body of standing water, these may become valuable habitats in their own right.

(d) Planting - planting with native tree, shrub and herbaceous species commonly found growing naturally in the local area, and non-aggressive grasses which allow colonisation by local wild flower species, may provide nature conservation benefits, as well as helping a road to fit more closely with the surrounding landscape. Replacing hedgerows along field boundaries may reconnect existing wildlife corridors or provide new ones.

(e) Tunnels under the road - to reinstate severed badger and toad runs and to allow safe passage for otters.

(f) Specialised fencing - can be used to protect animals such as deer and badgers, either by preventing access to roads or by channeling animals towards safe crossing points such as tunnels.

(g) Landform - irregularities in the slope of embankments and cuttings (where this will not affect safety) provide a greater range of micro-habitats for plants to colonise and can lead to greater species diversity.

(h) Natural regeneration - in certain circumstances, where a scheme passes through an area of conservation interest, consideration should be given to natural regeneration (ie no seeding or planting). This will encourage colonisation of verges by plant species from the surrounding area. Natural regeneration may not be appropriate where earthwork stability or other engineering constraints would be affected.

(i) In exceptional circumstances consideration may need to be given to the translocation or re-establishment of habitats eg by direct transplantation or use of seeds or soil from a protected area, if it is not possible to route schemes away from such sensitive areas.

6.3 To ensure that mitigation measures are successful in the long term, it may be necessary to develop management plans for particular sites. This will be most important where habitats are to be recreated or restored. Monitoring of the effectiveness of measures, after the road has been opened to traffic, may also be appropriate in certain circumstances. Any proposals for management or monitoring of measures, should be agreed in advance with the Overseeing Department's Project Manager and taken account of in the ecological assessment and the Environmental Statement.

7. STAGES OF ECOLOGICAL ASSESSMENT

7.1 Ecological assessments should become increasingly detailed as a scheme develops, and in accordance with the ecological importance of the area affected by the scheme. It is also particularly important that, as the ecological assessment becomes more detailed, it both informs and takes account of the development of mitigation measures. Assessment and design are part of an iterative process.

7.2 The physical scope of an ecological assessment will vary according to the nature of each individual scheme. The area to be considered may need to extend beyond the study area in order to encompass all significant impacts. This is particularly true where construction could result in changes to water flows and levels in sensitive wetland areas, or disturb important breeding sites for birds. Consultation with the statutory bodies, and other relevant environmental organisations, from Stage 2 is therefore most important to ensure that the scope of the assessment is appropriate. Proposals must be agreed with the Overseeing Department's Project Manager before the scope of the assessment is finalised.

Stage 1

7.3 The objective at this stage is to undertake sufficient assessment to identify the nature conservation constraints associated with particular broadly defined route corridors,as developed by the Design Organisation and agreed with the Overseeing Department's Project Manager. The Design Organisation should employ someone with experience of ecological assessment.

7.4 The steps to take are:

(i) obtain details of the location and nature of any designated sites in route corridors. This can be done by contacting the relevant statutory body and the local planning authorities.

(ii) gather information on existing surveys of the area, including Phase 1 Habitat Surveys and any carried out for other bodies. EN in England also holds aerial photographs for some parts of the country, which can be used to obtain a broad picture of land use and vegetation types. Full coverage exists for eastern England from the Wash to Bournemouth, and northern England, from Lancashire to Humberside, is reasonably well covered. The prints are mainly colour and have mostly been taken in the last five to ten years. They can be obtained via EN's regional offices. Advice on coverage in Scotland is available for 1988 (+/- one year). This has been interpreted to provide a detailed land cover map in digitised form at a scale of 1:25,000. Access to this data can be obtained by contacting the Macauley Land Use Research Institute, Craigiebucklen, Aberdeen AB9 2QJ.

7.5 The result of the ecological Stage I assessment, to be included in the Stage I report, should consist of:

(a) a map of the overall study area (1/25,000 to 1/10,000 scale, or as appropriate), with route corridors indicated, showing ecological constraints, such as designated sites, or other areas of potential ecological importance.

(b) a statement setting out the nature conservation interest of the study area, including any areas or sites within the study area which should be regarded as a constraint. This statement should also indicate, provisionally, whether surveys will be required, and if so, to what level of detail, noting any particular timing constraints.

Stage 2

7.6 The objective at this stage is to undertake sufficient assessment to identify the nature conservation factors, and the significance of effects upon them, to be taken into account by the Design Organisation in developing and refining route options, in agreement with the Overseeing Department's Project Manager.

7.7 The steps to be taken are:

(i) check with the relevant statutory body and the local planning authorities that no new sites have been designated in the study area, and whether any new survey work has been carried out, since Stage 1, which might have a bearing on route options.

Volume 11 home page

Information should also be sought from the statutory body on the existence of special projects, such as the species recovery programme, in the area (see CHAPTER 4, PARAGRAPH 4.3)

(ii) where the Stage 1 assessment and subsequent verification indicate that there is no evidence that any nature conservation interest will be significantly affected by a route option contact the relevant statutory body for confirmation that further work is not required;

(iii) where further work is required, verify and expand on the information provided by the Stage 1 study through a detailed desk study and preliminary walkover survey. This will be necessary in the majority of cases, to ensure that sufficient data are available on sites of nature conservation importance, before decisions are made on the choice of route options.

DETAILED DESK TOP ASSESSMENT

(iv) the Design Organisation should commission a detailed desk top assessment from an experienced ecologist. The assessment should identify all important sites for nature conservation which might be affected by some or all of a route option including the presence of protected species where this information is available. Its aim should be to evaluate all sites of nature conservation interest recorded in the Phase 1 Habitat Survey for the study area, or in other published surveys or documents, and to assess the significance of the likely impacts of the route options. This assessment will be based on the information produced for Stage 1, but will be more detailed and will focus on those routes which are being considered for Stage 2.

PRELIMINARY WALKOVER SURVEY

(v) the results of the detailed desk top assessment will almost always need to be verified by a preliminary walkover survey. This ensures that no undocumented sites or features of nature conservation importance are overlooked. A walkover survey may also be necessary to confirm the suspected presence or absence of protected or endangered species such as otters, badgers, dormice, bats, barn owls or great crested newts within the study area. A full list of protected species is given at ANNEX II. Advice on surveys is given in paragraphs 7.12 to 7.18. It is important to note that field surveys at this stage should be conducted to meet the objective of assessment at Stage 2, and are likely to be less detailed than those undertaken after the selection of a preferred route. The relevant statutory body should be consulted on the scope of the survey and final proposals should be agreed with the Overseeing Department's Project Manager.

(vi) prepare a statement which sets out the findings of the detailed desk-top assessment and the preliminary walkover survey, and assesses the significance of the probable impacts of route options on sites, areas or species of nature conservation interest;

(vii) obtain the relevant statutory body's `in confidence' views on the ecological assessment with respect to the impacts of route options on sites, areas or species of nature conservation interest;

7.8 The results of the ecological assessment at this stage, to be described in the Stage 2 Report should consist of:

(a) an up-dated version of the map produced for Stage 1. This should show all designated sites and areas; all sites advised by the statutory bodies as being of potential nature conservation importance; and, where relevant, all additional constraints identified by the walk-over survey;

(b) a statement which describes the nature conservation value of the study area; and assesses the significance of the possible ecological impacts of the route options taking account of any proposed mitigation measures agreed with the Overseeing Department's Project Manager. The statement should set out the criteria used to define levels of significance; indicate clearly any areas or sites within the study area which should be regarded as a constraint; and refer to the presence or absence of protected species without stating their location. It should state whether the impacts identified are likely to be temporary or permanent, or of local, regional or national significance. It should also describe, the survey techniques employed and their limitations if any, the

survey results, and the results of the desk study.

It may be helpful to group individual sites into habitat types in the report so that, for example, all wetland or grassland sites are considered in the same section;

(c) a separate statement containing the `in-confidence' views of officers of the relevant statutory body on the implications of route options for sites, areas or species of nature conservation interest.

Stage 3

7.9 The objective at this stage is to undertake sufficient assessment to identify any significant nature conservation impacts likely to arise from construction of the preferred route, and to identify the location, type and importance of all areas of significant nature conservation interest that may be affected.

7.10 In some cases, a sufficiently comprehensive survey of the preferred route will have been undertaken before Stage 3 and, after consultation with the relevant statutory body, there will be no need for further survey work. The only action required in these cases will therefore be:

(i) confirmation that the detailed desk study and walkover survey already undertaken provide sufficient information on the preferred route's nature conservation impacts;

(ii) assessment of the preferred route's nature conservation impacts and their significance;

(iii) consideration of whether any work to mitigate adverse impacts will be required before construction;

(iv) confirmation of the views of the relevant statutory body on the nature conservation impacts of the preferred route.

7.11 In some cases the desk study (and any walkover survey) conducted for Stage 2 may need to be supplemented by a further field survey, commissioned by the Design Organisation from an experienced ecologist. Where a field survey is to be carried out, its primary objective should be to determine the location and importance of all sites, areas or species of nature conservation interest which could be affected, and to assess how significant the preferred route's impact on them would be.

7.12 It may be helpful to contact local or specialist environmental groups (see ANNEX I), before a brief for the field survey is drawn up, to obtain any available detailed information on protected species in the area and data on any special projects which may be in hand to encourage the return of species which have been absent from the area for some years (eg the RSNC's Otters and Rivers Project). Data of this sort will help to produce a more focused and comprehensive brief and survey. This information may also be relevant to any necessary specialist surveys (see PARAGRAPH 7.17).

7.13 The field survey at Stage 3 will normally entail mapping those lengths of the preferred route identified as having potential nature conservation interest to Phase I Habitat Survey standards (although the relevant statutory body should be consulted on the extent of the survey). Phase 1 Habitat Surveys already exist for most areas of England and record semi-natural vegetation on 1:10,000 scale maps. They are available from the local planning authority (see ANNEX VII for more details).

7.14 Where a Phase 1 Habitat Survey exists, this should be used as the basis for the field survey, unless the relevant statutory body advises that it is out of date. Where a wholly new survey of any part of the route is needed, an appropriate methodology is set out in EN's `Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit'. Since the Phase 1 Habitat Survey methodology is restricted to vegetation, it will be necessary to make additional notes on the presence of fauna (ie birds, mammals, reptiles, insects, amphibians etc), as appropriate. For most of these groups standard survey methodologies exist (the statutory bodies can provide advice on this). For Scotland, Wales and Northern Ireland the relevant statutory bodies should be consulted for guidance on these matters.

7.15 Where a field survey has been completed, the Design Organisation should produce a statement describing the survey techniques employed (including any problems encountered which may have prevented a full survey) and stating the criteria used for evaluation (these will normally be the Ratcliffe criteria described in ANNEX VI). The statement should describe the location, type and importance of any designated sites which might be affected and should comment on the nature conservation value of

non-designated sites along the preferred route, in comparison to areas with statutory designations (eg an SSSI or LNR). It should assess the significance of the likely impacts of the preferred route on these sites (ie are they temporary or permanent or of local, regional or national significance) and should also describe any agreed mitigation measures for each impact identified.

7.16 The views of the relevant statutory body on the impact of the preferred route on nature conservation should be obtained.

7.17 In some cases - for example, where a preferred route could affect a very sensitive or important area, or where it is known that protected or endangered species (or groups of species) are present - it will be necessary for the Design Organisation to commission more detailed specialist surveys to determine the likely impacts of the route on these vulnerable species. Work of this sort should always be carried out by experts (details of appropriately experienced groups are available from the statutory bodies), and should be agreed in advance with the Overseeing Department's Project Manager

7.18 Where a specialist survey has been carried out, the Design Organisation should produce a statement which estimates the numbers of the species affected, states their location, and describes their habitat, feeding and breeding requirements. The statement should also assess their susceptibility to disturbance and comment on the relative importance of the group or colony (ie is it of local, regional, national or international significance). Comparative data on the various groups should be obtained from nationally based specialist bodies (for example, RSPB) wherever possible. This allows the size, and other aspects of the populations observed, to be put into a national context, making it easier to determine their significance.

7.19 Field surveys need to be carefully planned in order to provide meaningful information. Timing, in particular, can be critical and will vary according to local circumstances, and the species or habitats being investigated. **It is therefore vital that the need for, and scope of, each field survey is considered at the earliest possible stage. Failure to do so may result in delays to the publication of draft orders and the Environmental Statement**. Table 5 shows the ideal survey times for a range of habitats and plant species. In general terms, these fall between May and September. Table 6 provides advice on animals, indicating times when the seasonal value of sites for particular species is best assessed. Care should be taken about possible disturbance during these sensitive times.

7.20 The results of the ecological assessment at this stage should be described in the Environmental Statement and should consist of:

(a) colour coded or annotated maps, showing the different types and quality of habitat likely to be affected by the preferred route including designated areas and any other nature conservation constraints;

(b) a statement on the nature conservation value of the study area taking account of walkover, any field and specialist surveys, and noting the comments of the relevant statutory body. The statement should describe the nature conservation constraints and state their relative value. It should also assess the significance of the impacts of the preferred route on sites identified as being of nature conservation value, taking account of any agreed mitigation measures (including any recommendations for special management or monitoring of mitigation measures or site conditions), and assess the probable residual effects after mitigations. The statement should set out clearly the criteria used to define levels of significance;

(c) where relevant, a description of the results of any specialist surveys. This should assess the relative importance of the populations, or communities, of species surveyed and the impact of the preferred route on them, taking account of agreed mitigation. **Care should be taken to ensure that the exact location of protected species is not made public**.

8. FURTHER READING

8.1 This Common Inheritance - Britains Environmental Strategy (London : HMSO, 1990 Cm 1200)

8.2 This Common Inheritance - The First Year Report (London, HMSO)

8.3 This Common Inheritance - The Second Year Report (London, HMSO)

8.4 The Highways Act 1980 (London, HMSO)

8.5 The Roads (Scotland) Act 1984 (HMSO)

8.6 The Environmental Assessment (Scotland) Regulations 1988 No 1221

8.7 The Wildlife and Countryside Act 1981 (amended 1985) (London, HMSO)

*8.8 What you should know about Sites of Special Scientific Interest (English Nature, 1992)

8.9 Ratcliffe, DA ed : A Nature Conservation Review (Cambridge University Press, 1977)

*8.10 Guidelines for Selection of Biological SSSIs (Nature Conservancy Council, 1989)

8.11 Guidelines for Selection of Biological SSSIs: non - vascular plants (Joint Nature Conservation Committee, 1992)

8.12 Design Manual for Roads and Bridges - DMRB Volume 10. (Department of Transport, 1993)

*8.13 Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit (Nature Conservancy Council, 1990)

*8.14 Nature Conservation and Estuaries in Great Britain (Nature Conservancy Council, 1991)

8.15 Policy for Roads in England 1987 (London, HMSO, 1987 Cm 125 - I & II)

8.16 Can Roads be Bird Friendly? (Landscape Design Magazine, February 1992 p38 - 41 Dr D Hills and Dr D Hockin

*8.17 The Ecological Impact of Road Schemes (J Forbes and D Heath, Department of Transport and Nature Conservancy Council, 1990)

*8.18 Local Nature Reserves in England (English Nature 1991)

8.19 Transport and Road Research Laboratory Report 1061: An Assessment of the Conditions for Shrubs Along Motorways (D M Colwill, J R Thompson and A J Rutter, TRRL 1982)

* Available from EN publications

Volume 11 home page

SOURCES OF INFORMATION ON NATURE CONSERVATION MATTERS

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire
PE1 1JY

The Joint Nature Conservation Committee (JNCC) was established by the Environmental Protection Act 1990 for the purpose of nature conservation and fostering the understanding thereof in Great Britain as a whole or outside Great Britain. It is responsible for research and advice on nature conservation at both British and international levels.

ENGLAND

English Nature
Northminster House
Northminster
Peterborough
Cambridgeshire
PE1 1UA

EN is the statutory body with responsibility for providing advice and information on nature conservation to Government in England. The role of EN is set out in chapter 2 of this part. The addresses of EN's regional offices are shown on the map attached to this Annex.

Local Planning Authorities

Maintain information on Local Nature Reserves and other designated sites in their area.

Royal Society for Nature Conservation
The Green
Witham Park
Waterside South
Lincoln LN5 7JR

The RSNC is the national association of the wildlife trusts. Together the society and its partnership of trusts give information and advice on the management of wildlife habitats and on land use policies in the countryside. The society operates a network of reserves [voluntary, no statutory responsibilities].

The RSNC also co-ordinates the Otters and Rivers Project. This aims to encourage the return of otters to those areas of their traditional range from which they have disappeared in recent decades. Information on the presence or absence of otters in a given area and their patterns of dispersal can be obtained by writing to the projected at the RSNC address given above.

Royal Society for the Protection of Birds
The Lodge
Sandy
Bedfordshire
SG19 2DL

Europe's largest voluntary wildlife conservation body. The society works to protect nationally and internationally important populations of wild birds. It owns and manages a series of bird reserves throughout Great Britain.

National Federation for Biological Recording
c/o Environmental Information Centre
Biological Records Centre
Institute of Terrestrial Ecology
Monks Wood
Abbots Ripton
Huntingdon
Cambs PE17 2LS

The NFBR is the umbrella body for the environmental record centres. The Biological Records Centre holds information on the occurrence and distribution of over 16,000 different plant and animal species throughout the British Isles. Summaries of this information are published as atlases of species distribution.

National Federation of Badger Groups
c/o English Nature
Northminster House
Northminster
Peterborough
Cambridgeshire PE1 1UA

The Federation holds information on the many badger groups around the country and can advise on which ones are able to assist in conducting a survey in any particular area.

Hawk and Owl Trust,
c/o Zoological Society of London,
Regents Park,
London NW1 4RY

The Hawk and Owl Trust is a registered charity working for the conservation of all birds of prey including owls. The Trust carries out research into threatened species; advises landowners on habitat management projects to safeguard birds of prey; and wardens vulnerable nesting site. It also plays a leading role in conservation and monitoring of barn owls in Britain and Ireland.

WALES

Countryside Council for Wales
Plas Penrhos
Ffordd Penrhos
Bangor
Gwynedd LL57 2LQ Tel No: 0248 370444

CCW is the statutory body with responsibility for providing advice and information on nature conservation in Wales. The role of CCW is set out in Chapter 2 of this part.

CCW
North Wales Region
Hafod Elfyn
Ffordd Penrhos
Bangor
Gwynedd LL57 2LQ Tel No: 0248 372333

CCW
Dyfed and Mid Wales Region
Plas Gogerddan
Aberystwyth
Dyfed, SY23 3EE Tel No: 0970 828551

CCW
South Wales Region
43/44 The Parade
Roath
Cardiff, CF2 3UH Tel No: 0222 485111

Information on badgers and otters should be obtained initially from CCW and local Naturalist Trusts. The organisations listed below may be able to provide additional data.

Radnorshire Wildlife Trust
David Hargreaves
1 Gwalia Annex
Ithon Road
Llandrindod Wells
Powys LD1 6AS

The Trust is a voluntary organisation and holds information on badgers, otters and other protected species in Wales.

Otter Project Wales
Welsh Water Department
Fair Lane
Carmarthen
Dyfed SA31 1RX

The Otter project holds research data on otters and their habitats in Wales.

SCOTLAND

Scottish Natural Heritage
12 Hope Terrace
Edinburgh
EH9 2AS

SNH is the statutory body with responsibility for providing advice and information on nature conservation in Scotland. Its wider role in relation to natural heritage matters is set out in Chapter 2 of this Part.

Scottish Wildlife Trust
Crammond House
Kirk Crammond
Edinburgh
EH4 6NS

The Trust is affiliated to the Royal Society for Nature Conservation (RSNC)and acts for the RSNC in Scotland. It seeks to safeguard wildlife and its habitats throughout Scotland and manages a network of reserves.

NORTHERN IRELAND

Environment Service - Countryside and Wildlife
Department of the Environment (NI)
Commonwealth House
25 Castle Street
BELFAST
BT1 1GU

Council for Nature Conservation and the Countryside
Commonwealth House
25 Castle Street
BELFAST
BT1 1GU

Volume 11 home page

Royal Society for the Protection of Birds
Belvoir Park Forest
Belvoir
BELFAST

Ulster Wildlife Trust
3 New Line
Crossgar
DOWNPATRICK
Co Down
BT30 9EP

The Trust holds information on a range of species and many sites in Northern Ireland.

ENGLISH NATURE MAIN ADDRESSES

1 Northumbria Team
Newcastle
Tyneside 091 281 6316
Fax 091 281 6305
Team Manager:
Martyn Howat

2 Cumbria Team
Windermere (05394) 45286
Fax (05394) 88432
Team Manager:
Struan Wilson

3 North West Team
Wigan Pier, Blackrod
Wigan (0942) 820342
Fax (0942) 820364
Team Manager:
Robbie Bridson

4 North and East Yorkshire Team
York (0904) 432700
Fax (0904 432705
Team Manager:
Jeff Lunn

4a Leyburn
Wensleydale (0969) 23447
Fax (0969) 24190

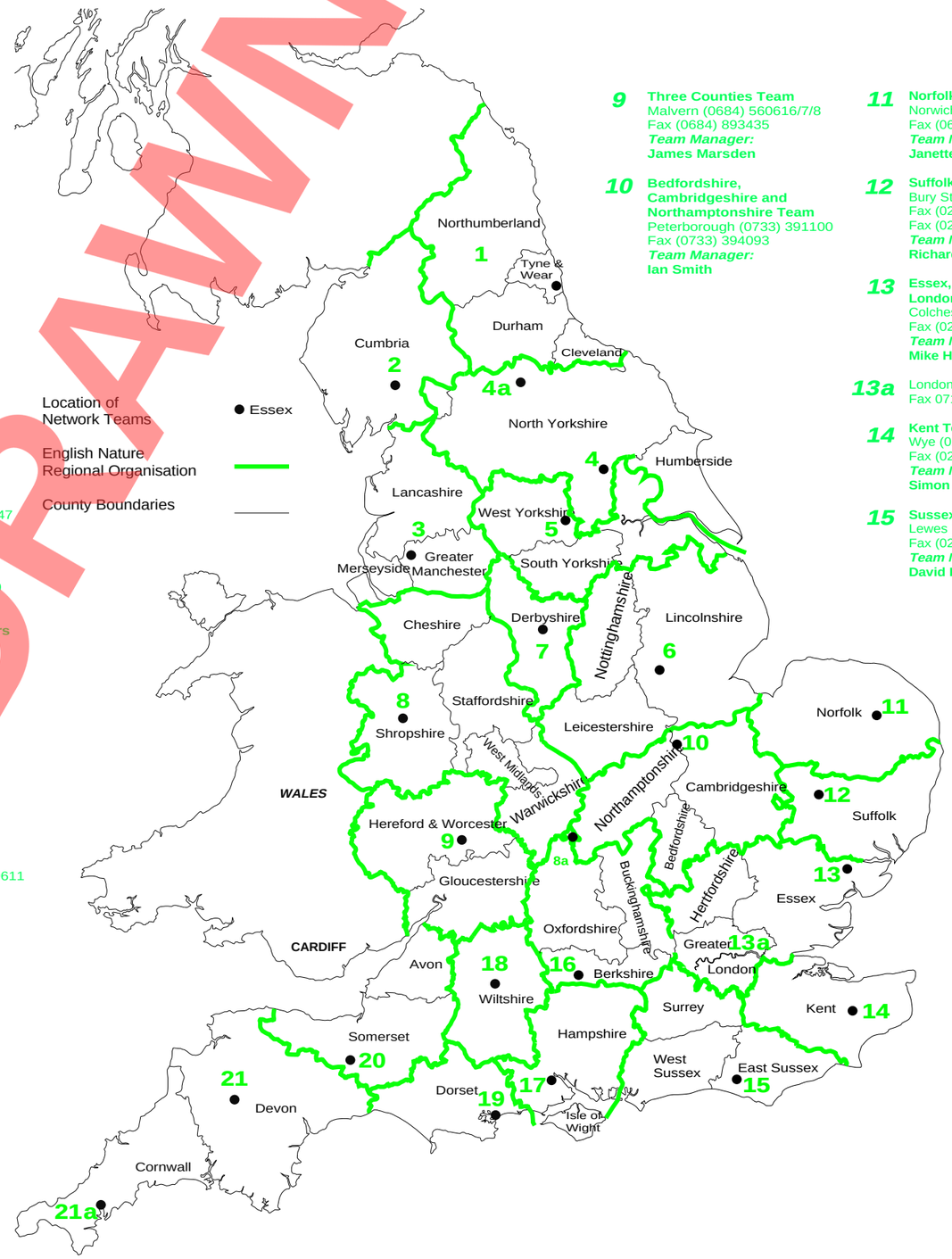
5 Humber to Pennines Team
Wakefield (0924) 387010
Fax (0924) 201507
Team Manager:
Lawrence Jones-Walters

6 East Midlands Team
Grantham (0476) 68431
Fax (0476) 70927
Team Manager:
Richard Findon

7 Peak District and Derbyshire Team
Bakewell (0629) 815095
Fax (0629) 815091
Team Manager:
Rob Williams

8 West Midlands Team
Shrewsbury
Upton Magna (0743) 709611
Fax (0743) 709303
Team Manager:
Peter Knights

8a Banbury
Banbury (0295) 257601



9 Three Counties Team
Malvern (0684) 560616/7/8
Fax (0684) 893435
Team Manager:
James Marsden

10 Bedfordshire, Cambridgeshire and Northamptonshire Team
Peterborough (0733) 391100
Fax (0733) 394093
Team Manager:
Ian Smith

11 Norfolk Team
Norwich (0603) 620558
Fax (0603) 762552
Team Manager:
Janette Ward

12 Suffolk Team
Bury St Edmunds
Fax (0284) 762218
Fax (0284) 764318
Team Manager:
Richard Rafe

13 Essex, Hertfordshire and London Team
Colchester (0206) 796666
Fax (0206) 794466
Team Manager:
Mike Henchman

13a London 071 831 6922
Fax 071 404 3369

14 Kent Team
Wye (0233) 812525
Fax (0233) 812520
Team Manager:
Simon Richardson

15 Sussex and Surrey Team
Lewes (0273) 476595
Fax (0273) 483063
Team Manager:
David Harvey

16 Thames and Chilterns Team
Newbury
Headly (0635) 268881
Fax (0635 268940
Team Manager:
David Henshilwood

17 Hampshire and Isle of Wight Team
Lyndhurst (0703) 283944
Fax (0703) 283834
Team Manager:
Graham Bathe

18 Wiltshire Team
Devizes (0380) 726344
Fax (0380) 721411
Team Manager:
Gwilym Wren

19 Dorset Team
Arne
Wareham (0929) 556688
Fax (0929) 554752
Team Manager:
Jim White

20 Somerset and Avon Team
Taunton (0823) 283211
Fax (0823) 272978
Team Manager:
Michael Woodhouse

21 Devon and Cornwall Team
Okehampton (0837) 55045
Fax (0837) 55046
Team Manager:
David Townsend

21a Trelissick
Truro (0872) 865261
Fax (0872) 865534

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SCOTTISH NATURAL HERITAGE

HEADQUARTERS OFFICES

Magnus Magnusson KBE (Chairman)
Roger Crofts (Chief Executive)
Policy, Resources, Press & Public Relations
12 Hope Terrace, Edinburgh. EH9 2AS.
Tel: 031 447 4784 Fax: 031 447 0055

Research & Advisory Services, Library
2/5 Anderson Place, Edinburgh, EH6 6NP
Tel: 031 554 9797 Fax: 031 554 7900

Education & Training, Publications
Battleby, Redgorton, Perth, PH1 3EW.
Tel: 0738 27921 Fax: 0738 30583

NORTH WEST REGION

Regional Chaiman: Sir John Lister-Kaye Bt.
Regional Director Dr Peter Tilbrook
Fraser Darling House, 9 Culduthel Road
Inverness, IV2 4AG.
Tel: 0463 239431 Fax: 0463 710713

Inverness and Ross & Cromarty Area
Area Manager Quentin McLaren
Dingwall Business Park
Strathpeffer Road, Dingwall
Ross-shire IV15 9QF
Tel: 044 584 244 Fax: 044 584 227

Westem Isles Area
Area Manager Stewart Angus
17-19 Francis Street, Stornoway, Lewis.
Tel: 0851 705258 Fax: 0851 704900

Lochaber and Skye & Lochalsh Area
Area Manager Chris Eatough
Mamore House, The Parade, Fort William,
Inverness-shire
Tel: 0397 704716 Fax: 0397 705030

Caithness and Sutherland Area
Area Manager: Terry Keatinge
Main Street, Golspie, Sutherland, KW10 6TG.
Tel: 0408 633602 Fax: 0408 633071

SOUTH WEST REGION

Regional Chairman: The Earl of Dalkeith
Regional Director Chris Fox
Caspian House, Mariner Court,
Clydebank Business Park,
Clydebank G81 2NR
Tel: 0389 58511 Fax: 0389 58876

Argyll & Bute Area
Area Manager: Carmen Placido
1 Kilmory Industrial Estate, Kilmory,
Lochgilphead, Argyll, PA31 8RR.
Tel: 0546 603611 Fax: 0546 602298

Mid and South Strathclyde Area
Area Manager John Burlison
The Castle, Balloch Castle Country Park,
Balloch, Dunbartonshire, G83 8LX.
Tel: 0389 58511 Fax: 0389 58876

Dumfries and Galloway Area
Area Manager Marion Hughes
106 High Street, Dalbeattie,
Kirkcudbrightshire, DG5 4HB.
Tel: 0556 610086 Fax: 0556 611924

NORTH EAST REGION

Regional Director David Laird
Reglonal Director Dr Ian Jardine
16/17 Rubislaw Terrace, Aberdeen, AB1 1XE.
Tel: 0224 642863 Fax: 0224 643347

Northern Isles Area
Area Manager Ruth Briggs
2-4 Alexandra Building, The Esplanade,
Lerwick, Shetland, ZE1 OLL.
Tel: 0595 3345 Fax: 0595 2565

East Grampian Area
Area Manager Dr Ron MacDonald
16/17 Rubislaw Terrace, Aberdeen, AB1 1XE.
Tel: 0224 642863 Fax: 0224 643347

Strathspey Area
Area Manager: Dick Balharry
Achantoul, Aviemore,
Inverness-shire, PH22 1QD.
Tel: 0479 810477 Fax: 0479 811363

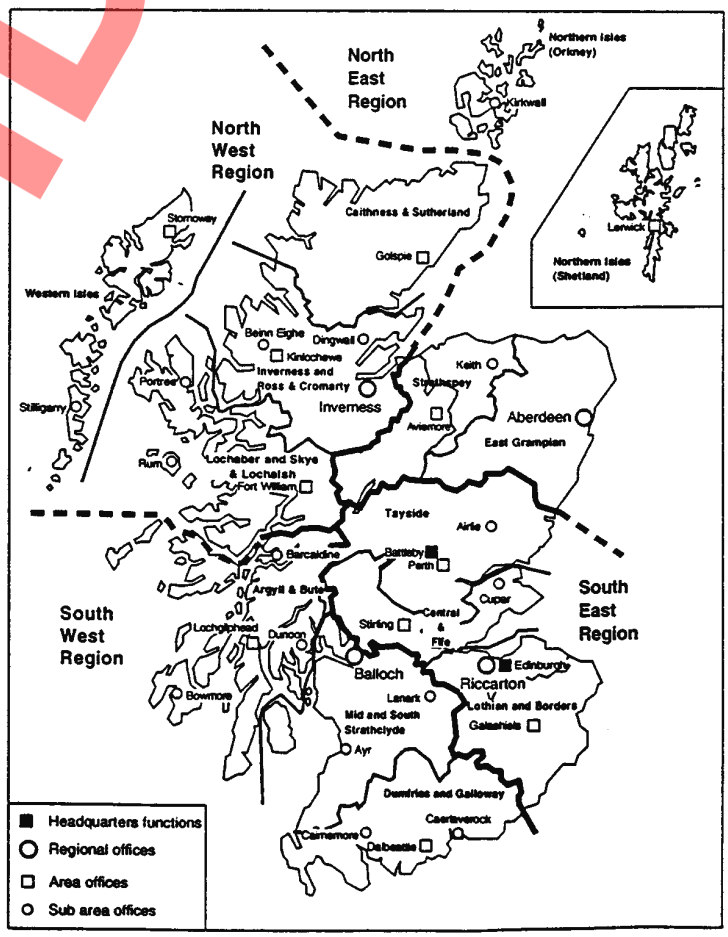
SOUTH EAST REGION

Regional Chairman: Mrs Nan Burnett
Regional Director Jane Dalgleish
Battleby House, Redgorton, Perthshire PH1 3EW.
Tel: 031 449 4933 Fax: 031 451 5166

Tayside Area
Area Manager Laughton Johnston
55 York Place, Perth, PH2 8EH.
Tel: 0738 39746 Fax: 0738 442060

Central and Fife Area
Area Manager Richard Ferguson
The Beta Centre, Innovation Park,
University of Stirling, Stirling, FK9 4NF
Tel: 0786 50362 Fax: 0786 51974

Lothian and Borders Area
Area Manager Chris Badenoch
38 Gala Park, Galashiels, TD1 1EU.
Tel: 0896 56652 Fax: 0896 50427



PROTECTED SPECIES

SPECIES SPECIALLY PROTECTED UNDER THE WILDLIFE AND COUNTRYSIDE ACT, 1981 (ENGLAND, SCOTLAND AND WALES ONLY)

These species are protected under Schedule 5 of the Wildlife and Countryside Act, 1981, as amended and revised. Badgers and their setts now enjoy comparable protection under their own Act (Protection of Badgers Act 1992). Deer and seals are not so fully protected, but have their own legislation.

Scientific Names	English Names	Notes
Mammals		
Cetacea	All dolphins, porpoises, whales	
Felis sylvestris	Wildcat	
Lutra lutra	Otter	
Martes martes	Pine marten	
Muscardinus avellanarius	Dormouse	
Odobenus rosmarus	Walrus	
Sciurus vulgaris	Red squirrel	
Vespertilionidae and Rhinolophidae	All bats	
Reptiles		
Anguis fragilis	Slow worm	Killing, injuring, Sale only
Cheloniidae and Dermochelyidae	All turtles	
Coronella austriaca	Smooth snake	
Lacerta agilis	Sand lizard	Killing, injuring, Sale only
L. vivpara	Viviparous lizard	Killing, injuring, Sale only
Natrix natrix	Grass snake	Killing, injuring, Sale only
Vipera berus	Adder	Killing, injuring, Sale only
Amphibians		
Bufo bufo	Common toad	Sale only
B. calamita	Natterjack toad	
Rana temporaria	Common frog	Sale only
Triturus cristatus	Warty (great crested) newt	
T. helveticus	Palmate newt	Sale only
T. vulgaris	Smooth newt	Sale only

THESE LISTS MAY BE SUBJECT TO CHANGE

Scientific Names	English Names	Notes
Fish		
Acipenser sturio	Sturgeon	
Alosa alosa	Allis shad	Killing, injuring, Taking only
Coregonus albula	Vendace	
C. lavaretus	Whitefish	
Lota lota	Burbot	
Butterflies		
Apatura iris	Purple emperor	Sale only
Argynnis adippe	High brown fritillary	
Aricia artaxerxes	Northern brown angus	Sale only
Boloria euphrosyne	Pearl-bordered fritillary	Sale only
Carterocephalus palaemon	Checkered skipper	Sale only
Coenonympha tullia	Large heath	Sale only
Cupido minimus	Small blue	Sale only
Eurodryas aurinia	Marsh fritillary	Sale only
Erebia epiphron	Mountain ringlet	Sale only
Hamearis lucina	Duke of Burgundy fritillary	Sale only
Hesperia comma	Silver-spotted skipper	Sale only
Leptidea sinapis	Wood white	Sale only
Lycaena dispar	Large copper	Sale only
Lysandra bellargus	Adonis blue	Sale only
L. coridon	Chalkhill blue	Sale only
Maculinea arion	Large blue	
Mellicta (Melitaea) athalia	Heath fritillary	
Melitaea cinxia	Glanville fritillary	Sale only
Nymphalis polychloros	Large tortoiseshell	Sale only
Papilio machaon	Swallowtail	
Plebejus argus	Silver-studded blue	Sale only
Strymonidia pruni	Black hairstreak	Sale only
Strymonidia w-album	White-letter hairstreak	Sale only
Thelca betulae	Brown hairstreak	Sale only
Thymelicus acteon	Lulworth skipper	Sale only
Moths		
Acosmetia caliginosa	Reddish buff	
Hadena irregularis	Vipers' bugloss	
Pareulype berberata	Barberry carpet	
Siona lineata	Black-veined	
Thalera fimbrialis	Sussex emerald	
Thetidia smaragdaria	Essex emerald	
Zygaena viciae	New Forest burnet	

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Scientific Names	English Names	Notes
Beetles		
Chrysolina cerealis	Rainbow leaf beetle	
Curimopsis nigrita	Mire pill beetle	Damage/obstruction of place of shelter/ protection
Graphoderus zonatus	Water beetle	
Hydrochara caraboides	Lesser silver water beetle	
Hypebaeus flavipes	Beetle	
Limoniscus violaceus	Violet click beetle	
Paracymus aeneus	Water beetle	
Bugs		
Cicadetta montana	New Forest cicada	
Grasshoppers and crickets		
Decticus verrucivorus	Wart-biter	
Gryllotalpa gryllotalpa	Mole cricket	
Gryllus campestris	Field cricket	
Dragonflies		
Aeshna isosceles	Norfolk aeshna	
Spiders		
Dolomedes plantarius	Fen raft spider	
Eresus niger	Ladybird spider	
Crustaceans		
Austropotamobius pallipes	Atlantic (white-clawed) crayfish	Taking and sale only
Chirocephalus diaphanus	Fairy shrimp	
Gammarus insensibilis	Lagoon and shrimp	
Triops cancriformis	Apus	
Sea-mats (bryozoa)		
Victorella pavida	Trembling sea-mat	

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Scientific Names	English Names	Notes
Molluscs		
Caecum armoricum	DeFolin's lagoon snail	
Catinella arenaria	Sandbowl snail	
Margaritifera margaritifera	Pearl Mussel	Killing and injuring only
Myxas glutinosa	Glutinous snail	
Paludinella littorina	Lagoon snail	
Tenellia adspersa	Lagoon sea slug	
Thyasira gouldi	Northern hatchet-shell	
Worms (Annelida)		
Alkmaria romijni	Tentacled lagoon-worm	
Armandia cirrhosa	Lagoon sandworm	
Hirudo medicinalis	Medicinal leech	
Sea anemones and allies (Cnidaria)		
Edwardsia ivelli	Ivell's sea anemone	
Eunicella verrucosa	Pink sea-fan	Killing, injuring, taking possession, Sale only
Nematostella vectensis	Startlet sea anemone	

Protection for wild animals on Schedule 5 (Under Section 9)

Part 1 - intentional killing, injuring, taking

2 - possession or control (live or dead animal, part or derivative)

4(a) - damage to, destruction of, obstruction of access to any structure or place used for shelter or protection

4(b) - disturbance of animal occupying such a structure or place

5(a) - selling, offering for sale, possession or transport for purpose of sale (live or dead animal, part or derivative)

5(b) - advertisement for buying or selling such things

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Volume 11 home page

PROTECTED PLANT SPECIES

These species are protected under Schedule 8 of the Wildlife and Countryside Act, 1981, as amended and revised. It is an offence for anyone intentionally to pick up root or destroy any of the wild plants listed in Schedule 8, or even to collect their flowers and seeds.

Scientific Name	English Name
Vascular plants	
Ajuga chamaepitys	Ground pine
Alisma gramineum	Ribbon-leaved water-plantain
Allium sphaerocephalon	Round-headed mallow
Althaea hirsuta	Rough marsh mallow
Alyssum alyssoides	Small alison
Apium repens	Creeping marshwort
Arabis alpina	Alpine rock-cress
A. stricta	Bristol rock-cress
Arenaria norvegica	Norwegian sandwort
Artemisia campestris	Field wormwood
Bupleurum baldense	Small hare's ear
B. falcatum	Sickle-leaved hare's ear
Calamintha sylvatica	Wood calamint
Carex depauperata	Starved wood-sedge
Centaurium tenuiflorum	Slender centaury
Cephalanthera rubra	Red helleborine
Chenopodium vulvaria	Stinking goosefoot
Cicerbita alpina	Alpine sow-thistle
Corrigiola litoralis	Strapwort
Cotoneaster integerrimus	Wild cotoneaster
Crassula aquatica	Pigmyweed
Crepis foetida	Stinking hawk's-beard
Cynoglossum germanicum	Green hound's-tongue
Cyperus fuscus	Brown galingale
Cypripedium calceolus	Lady's slipper
Cystopteris dickieana	Dickie's bladder fern
Dactylorhiza lapponica	Lapland marsh orchid
Damasonium alisma	Starfruit
Diapensia lapponica	Diadpensia
Dianthus gratianopolitanus	Cheddar pink
Epipactis youngiana	Young's helleborine
Epipogium aphyllum	Ghost orchid
Equisetum ramosissimum	Branched horsetail
Erigeron borealis	Alpine fleabane
Eriophorum gracile	Slender cottongrass
Eryngium campestre	Field eryngo
Filago lutescens	Red-tipped cudweed
F. pyramidata	Broad-leaved cudweed
Fumaria martinii	Martin's ramping-fumitory

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Scientific Name	English Name
Gagea bohemica	Early star of Bethlehem
Gentiana nivalis	Alpine gentian
G. verna	Spring gentian
Gentianella anglica	Early gentian
G. ciliata	Fringed gentian
G. uliginosa	Dune gentian
Gladiolus illyricus	Wild gladiolus
Gnaphalium luteoalbum	Jersey cudweed
Halilmione pedunculata	Stalked orache
Hieracium attenuatifolium	Weak-leaved hawkweed
H. northroense	Northroe hawkweed
H. zetlandicum	Shetland hawkweed
Himantoglossum hircinum	Lizard orchid
Homogyne alpina	Purple colt's-foot
Lactuca saligna	Least lettuce
Limosella australis	Welsh mudwort
Liparis loeselii	Fen orchid
Lloydia serotina	Snowdon lily
Luronium natans	Floating water-plantain
Lychnis alpina	Alpine catchfly
Lythrum hyssopifolia	Grass-poly
Melampyrum arvense	Field cow-wheat
Metha pulegium	Pennyroyal
Minuartia stricta	Teesdale sandwort
Najas flexilis	Slender naiad
N. marina	Holly-leaved naiad
Ononis reclinata	Small restharrow
Ophioglossum lusitanicum	Least adder's-tongue
Ophrys fuciflora	Late spider orchid
O. sphegodes	Early spider orchid
Orchis miliataris	Military orchid
O. simia	Monkey orchid
Orobanche caryophyllacea	Bedstraw broomrape
O. loricata	Oxtongue broomrape
O. reticulata	Thistle broomrape
Petroraghia nanteuilii	Childing pink
Phyteuma spicatum	Spiked rampian
Polygonatum verticillatum	Whorled Soloman's seal
Polygonum maritimum	Sea knotgrass
Potentilla rupestris	Rock cinquefoil
Pulicaria vulgaris	Small fleabane
Phyllodoce caerulea	Blue heath
Pyrus cordata	Plymouth pear
Ranunculus ophioglossifolius	Adder's-tongue spearwort
Rhinanthus serotinus	Greater yellow-rattle
Rhynchosinapis wrightii	Lundy cabbage
Romulea columnae	Sand crocus
Rumex rupestris	Shore dock
Salvia pratensis	Meadow clary

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Volume 11 home page

Scientific Name	English Name
Saxifraga bernua	Drooping saxifrage
S. cespitosa	Tufted saxifrage
S. hirculus	Yellow marsh-saxifrage
Scirpus triquetrus	Triangular club-rush
Scleranthus perennis	Perennial knawel
Scorzonera humilis	Viper's-grass
Selinum carvifolia	Cambridge milk-parsley
Senecio paludosus	Fen ragwort
Stachys alpina	Limestone woundwort
S. germanica	Downy woundwort
Teucrium botrys	Cut-leaved germander
T. scordium	Water germander
Thlaspi perfoliatum	Perfoliate penny-cress
Trichomanes speciosum	Killarney fern
Veronica spicata	Spiked speedwell
V. triphyllos	Fingered speedwell
Viola persicifolia	Fen violet
Woodsia alpina	Alpine woodsia
W. ilvensis	Oblong woodsia

Mosses

Acaulon triquetrum	Triangular pygmy-moss
Barbula cordata	Cordate beard-moss
B. glauca	Glaucous beard-moss
Bartramia stricta	Rigid apple-moss
Bryum mamillatum	Dune thread-moss
B. schleicheri	Schleicher's thread-moss
Buxbaumia viridis	Green shield-moss
Cryphaea lamyana	Multi-fruited river-moss
Cyclodictyon laetevirens	Bright green cave-moss
Ditrichum cornubicum	Cornish path-moss
Drepanocladus vernicosus	Slender green feather-moss
Grimmia unicolor	Blunt-leaved grimmia
Hypnum vaucheri	Vaucher's feather-moss
Micromitrium tenerum	Millimetre moss
Mielichhoferia mielichhoferi	Alpine copper-moss
Orthotrichum obtusifolium	Blunt-leaved bristle-moss
Plagiothechium piliferum	Hair silk-moss
Rhynchostegium rotundifolium	Round-leaved feather-moss
Saelania glaucescens	Blue dew-moss
Scorpidium turgescens	Large yellow feather-moss
Sphagnum balticum	Baltic bog-moss
Thamnobryum angustifolium	Derbyshire feather-moss
Zygodon forsteri	Knothole moss
Zygodon gracilis	Nowell's limestone moss

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Volume 11 home page

Scientific Name	English Name
Liverworts	
Adelanthus lindenbergianus	Lindenberg's leafy liverwort
Geocalyx graveolens	Turpswort
Gymnomitrion apiculatum	Pointed frostwort
Jamesoniella undulifolia	Marsh earwort
Leiocolea rutheana	Norfolk flapwort
Marsupella profunda	Western rustwort
Petalophyllum ralfsii	Petalwort
Riccia bifurca	Lizard crystalwort
Southbya nigrella	Blackwort
Lichens	
Bryoria furcellata	Forked hair-lichen
Buellia asterella	Starry breck-lichen
Caloplaca luteoalba	Orange-fruited elm-lichen
Caloplaca nivalis	Snow caloplaca
Catapyrenium psoromoides	Tree catapyrenium
Catillaria stricta	Upright mountain cladonia
Collema dichotomum	River jelly lichen
Gyalecta ulmi	Elm gyalecta
Heterodermia leucomelos	Ciliate strap-lichen
Heterodermia propagulifera	Coralloid rosette-lichen
Lecanactis hemisphaerica	Churchyard lecanactis
Lecanora achariana	Tarn lecanora
Lecidea inops	Copper lecidea
Nephroma arcticum	Arctic kidney-lichen
Pannaria ignobilis	Caledonian pannaria
Parmelia miniarum	New Forest parmelia
Parmentaria chilensis	Oil-stain parmentaria
Peltigera lepidophora	Ear-lobed dog-lichen
Pertusaria bryontha	Alpine moss pertusaria
Physcia tribacioides	Southern grey physcia
Pseudocyphellaria lacerata	Ragged pseudocyphellaria
Psora rubiformis	Rusty alpine psora
Solenopsora liparina	Serpentine solenopsora
Squamarina lentigera	Scaly breck-lichen
Teloschistes flavicans	Golden hair-lichen
Stoneworts	
Chara canescens	Bearded stonewort
Lamprothamniun papulosum	Foxtail stonewort

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Volume 11 home page

Protection for wild plants (Under Section 13)

Part 1(a) - intentional picking, uprooting or destruction of plants on Schedule 8

1(b) - unauthorised intentional uprooting of any wild plant not included on Schedule 8

2(a) - selling, offering for sale, possession or transport for the purpose of sale any plant (live or dead, part or derivative) on Schedule 8

2(b) - advertisement for buying or selling such things

SPECIES OF RARE OR VULNERABLE BIRD LISTED ON ANNEX I OF EC DIRECTIVE 79/409/EEC ON THE CONSERVATION OF WILD BIRDS THAT REGULARLY OCCUR IN THE UK

Arctic tern
Avocet
Barnacle goose
Bewick's swan
Bittern
Black tern
Black-throated diver
Capercaillie
Chough
Common tern
Corncrake
Dartford Warbler
Dotterel
Golden eagle
Golden plover
Great Northern diver
Hen harrier
Honey buzzard
Kingfisher
Leach's petrel
Little tern
Marsh harrier
Montagu's harrier
Mediterranean gull
Merlin
Nightjar
Osprey
Peregrine
Red-backed shrike
Red kite
Red-necked phalarope
Red-throated diver
Roseate tern
Ruff
Sandwich tern
Scottish crossbill
Short-eared owl
Slavonian grebe
Snowy owl
Spotted crake
Stone curlew
Storm petrel
White-fronted goose (Greenland race)
White-tailed eagle
Whooper swan
Woodlark
Wood sandpiper
Wren (Fair Isle race only)

* Regularly occuring migratory species are afforded the same protection under Article 4.2 of the Directive

THESE LISTS MAY BE SUBJECT TO CHANGE

WILD BIRDS LISTED ON SCHEDULE 1 OF THE WILDLIFE & COUNTRYSIDE ACT 1981

Avocet
Barn owl
Bee-eater
Bearded tit
Bewick's swan
Bittern
Black-necked grebe
Black redstart
Black-tailed godwit
Black tern
Black-throated diver
Black-winged stilt
Bluethroat
Brambling
Cetti's warbler
Chough
Cirl bunting
Common quail
Common scoter
Corncrake
Crested tit
Crossbills (all species)
Dartford Warbler
Divers (all species)
Dotterel
Fieldfare
Firecrest
Garganey
Golden Eagle
Golden oriole
Goshawk
Great Northern diver
Green sandpiper
Greenshank
Gyr falcon
Harriers (all species)
Hen harrier
Hobby
Honey buzzard
Hoopoe
Kentish plover
Kingfisher
Lapland bunting
Leach's petrel
Little bittern
Little gull
Little ringed plover
Long-tailed duck
Little tern
Marsh harrier
Marsh warbler
Mediterranean gull
Merlin
Montagu's harrier
Osprey
Peregrine
Purple heron
Purple sandpiper
Red-backed shrike
Red kite
Red-necked phalarope
Red-throated diver
Redwing
Roseate tern
Ruff
Savi's warbler
Scarlet rosefinch
Scaup
Scottish crossbill
Serin
Shorelark
Short-toed treecreeper
Slavonian grebe
Snow bunting
Snowy owl
Spoonbill
Spotted crake
Stone curlew
Temminck's stint
Whimbrel
White-tailed eagle
Whopper swan
Woodlark
Wood sandpiper
Wryneck
Velvet scoter

THESE LISTS MAY BE SUBJECT TO CHANGE

PROTECTED ANIMAL AND PLANT SPECIES IN NORTHERN IRELAND

Protected species under the Wildlife (NI) Order 1985. (Note, these lists are currently subject to review and may consequently change).

Birds

With certain exceptions all wild birds, their eggs and nests are protected at all times.

The following birds may be shot by authorised persons during the whole of the year:-

Great Black-backed Gull	Feral Pigeon	Hooded/Carrion Crow
Herring Gull	Wood Pigeon	Jackdaw
Lesser Black-backed Gull	House Sparrow	Magpie
	Starling	Rook

The following birds may be shot by authorised persons during the season 1 September until 31 January inclusive:-

Curlew	Gadwall	Scaup
Golden Plover	Goldeneye	Shoveler
Canada Goose	Mallard	Teal
Grey-lag Goose	Pintail	Tufted Duck
Pink-footed Goose	Pochard	Wigeon

Animals

The following animals are protected at all times:-

Badger	Common Seal	Brimstone Butterfly
Bats (all species)	Grey Seal	Dingy Skipper Butterfly
Cetaceans (Dolphins,	Common (or viviparous)	Holly Blue Butterfly
Porpoises and Whales)	Lizards	Large Heath Butterfly
Common Newt	Pine Marten	Marsh Fritillary
Common Otter	Red Squirrel	Butterfly
		Purple Hairsteak
		Butterfly
		Small Blue Butterfly

PROTECTED PLANT SPECIES

The species listed below are specially protected in Northern Ireland

Common Name

Avens, Mountain
Barley, Wood
Betony
Broomrape, Ivy
Buckthorn, Alder
Bugle, Pyramidal
Campion, Moss
Cat's ear, Smooth
Centaury, Seaside
Cloudberry
Clubmoss, Marsh
Cowslip
Cow-wheat, Wood
Cranesbill, Wood
Cress, Shepherd's
Crowfoot, Water
Fern, Holly
Fern, Kilarney
Fern, Oak
Fleabane, Blue
Globe-flower
Grass, Blue-eye
Grass, Holy
Heath, Cornish
Helleborine, Green-flowered
Helleborine, Marsh
Moschatel, or Town Hall Clock
Mudwort
Orchid, Bee
Orchid, Bird's Nest
Orchid, Bog
Orchid, Green-winged
Orchid, Irish Lady's Tresses
Orchid, Narrow-leaved Marsh
Orchid, Small white
Oyster-plant
Pea, Marsh
Pennyroyal
Pillwort
Rosemary, Bog
Saw-wort, Mountain
Saxifrage, Purple
Saxifrage, Yellow Marsh
Saxifrage, Yellow Mountain
Sea-lavender, Rock
Sedge, Broad-leaved Mud
Sedge, Few-flowered
Small-reed, Northern
Spike-rush
Thistle, Melancholy
Violet, Fen
Violet, Water
Waterwort, Eight-stamened
Wintergreen, Serrated
Yellow Bird's-nest

Volume 11 home page

SUMMARY OF CURRENT CONSERVATION LEGISLATION

LEGISLATION	RELEVANT SECTIONS	COVERAGE
ENGLAND AND WALES		
1949 National Parks & Access to the Countryside Act	section 19	National Nature Reserves (NNRs)
	section 21	Local Nature Reserves (LNRs)
1968 Countryside Act	section 11	Duty to have regard to nature conservation
1981 Wildlife & Countryside Act (amended 1985)	section 3	Areas of Special Protection for Birds (AOSPs)
	section 28	Sites of Special Scientific Interest (SSSIs)
	section 29	Nature Conservation Orders (NCOs)
	section 34	Limestone Pavement Orders (LPOs)
	section 35	National Nature Reserves (NNRs)
	section 36	Marine Nature Reserves (MNRs)
	Schedule 1	Protected bird species
	Schedule 5	Protected animal species
	Schedule 8	Protected plant species

THESE LISTS MAY BE SUBJECT TO CHANGE

LEGISLATION	RELEVANT SECTIONS	COVERAGE
1990 Environmental Protection Act	sections 128-139 Schedules 6-10	Established 3 conservation councils and the joint Nature Conservation Committee to succeed the NCC
1992 Badgers Act (consolidated 1973 and 1991 Badgers Acts)		Protection of badgers and their setts
SCOTLAND		
1991 Natural Heritage (Scotland) Act	section 6	National Heritage Areas (NHAs)
NORTHERN IRELAND		
1985 Nature Conservation and Amenity Lands (NI) Order	Article 4	Duty of public bodies
	Article 16	Declaration of Nature Reserves
	Article 18	National Nature Reserves
	Article 20	Marine Nature Reserves
	Article 22	District Council Nature Reserves
	Article 24	Areas of Special Scientific Interest

THESE LISTS MAY BE SUBJECT TO CHANGE

LEGISLATION	RELEVANT SECTIONS	COVERAGE
1985 Wildlife (NI) Order	Article 4	Protection of wild birds
	Article 10	Protection of certain wild birds
	Article 14	Protection of wild plants
EC Directives:	Title	
79/409/EEC	Conservation of Wild Birds	Special Protection Areas (SPAs) Protected bird species and associated habitats
85/337/EEC	Assessment of the Effects of Certain Public and Private Projects on the Environment	Specifies what should be covered in an ES, in relation to flora and fauna, soil, water etc.
92/43/EEC	Conservation of Natural Habitats of Wild Fauna and Flora	Will set up Special Areas of Conservation (SACs), although none designated as yet, protecting plant and animal species and habitats.

THESE LISTS MAY BE SUBJECT TO CHANGE

DESIGNATED SITES

Sites of International Importance

World Heritage Sites

World Heritage Sites are designated under the UNESCO Convention for the Protection of the World Cultural and Natural Heritage. Each country which is a party to the Convention nominates a list of sites which it considers to be of 'outstanding universal value' when measured against a set list of criteria. Major natural and semi-natural ecosystems of international importance merit consideration under the natural property category.

Information from: DOE.
SO
WO/CADW

Statutory designation: No single designation. Could be SSSI, National Park, etc.

Biosphere Reserves

Biosphere Reserves have been designated under the UNESCO 'Man and The Biosphere Programme' to conserve, for present and future use, the diversity and integrity of communities of plants and animals within natural ecosystems, and to safeguard the genetic diversity of species. They are considered to be of particular use as long-term observatories by which environmental change can be monitored. Thirteen Biosphere Reserves have been designated in the UK all based on NNRs.

Information from: DOE/JNCC.
SO
WO/CCW
ES:CW

Statutory designation: NNR.

Biogenetic Reserves

Biogenetic Reserves are sites identified by a Council of Europe designation. The designation aims to secure long-term conservation of a representative sample of biotopes (habitat types) of European significance. Eighteen grassland and heathland sites have been designated in the UK. An additional designation is `Council of Europe Diploma Site'. These sites are protected for their aesthetic or recreational value as well as their ecological interest.

Information from: DOE.
SO
WO/CCW

Statutory designation: NNR or SSSI

Ramsar Sites - Wetlands of International Importance

Ramsar Sites are designated under the Ramsar Convention on the conservation of Wetlands of International Importance especially as waterfowl habitat. Governments who have ratified the Convention (including the UK Government) have undertaken to conserve wetlands generally and Ramsar sites in particular. The means of designation is through a Parliamentary announcement and notification to the Ramsar bureau.

The Convention has the status of a legal treaty, and requires parties to inform the secretariat to the Convention of any changes or likely changes in the ecological character of designated sites. The criteria for designation include rarity and diversity of both habitats and species, and fragility of ecosystems. Coastal as well as inland areas are covered, and protection extends to the wildfowl and plant communities on each site. At present all designated sites are Sites of Special Scientific Interest.

Whilst the requirements of the Convention cannot be enforced through any court, the Government is firmly committed to protecting these valuable habitats and their nature conservation importance should be taken into account when developing road schemes.

Information from: DOE/JNCC/EN
SO
WO/CCW
ES:CW

Statutory designation: SSSI/ASSI

Special Protection Areas (SPAs)

SPAs are designated under the EC Directive (79/409/EEC) on the Conservation of Wild Birds. This sets out the general rules for conservation of wild birds their eggs, nests and habitats, and requires member states to designate SPAs for regularly occurring migratory species and certain key species (see ANNEX III). The aim is to classify, and thus protect, sufficient habitat to ensure the survival and reproduction of these species in their area of distribution. There is considerable overlap between SPAs and Ramsar sites, many of which are

designated in common. All SPAs are also notified as SSSIs.

Information from: DOE/JNCC
SO
WO/CCW
ES:CW
Statutory designation: SSSI/ASSI

Special Areas of Conservation (SACs)

SACs are created under the EC Habitats Directive (92/43/EEC), and provide protection for certain key habitat types and species. The Directive came into force in May 1992. Details of SACs have to be agreed by June 1998. As yet, no sites have been designated. The aim is to ensure that these habitat types and species are maintained at a favourable conservation status in their natural ranges.

Information from: DOE/JNCC/EN
SO
WO/CCW
ES:CW
Statutory designation: SSSI/ASSI

Note: Potential SPAs and (in future) identified SACs which have not been formally designated, should, for development control purposes, be treated in the same way as formally designated sites.

The Berne Convention

The `Berne' Council of Europe Convention on the Conservation of European Wildlife and Natural Habitats covers the protection of mammals, birds, amphibians, reptiles, freshwater fish, invertebrates and plants. It requires contracting parties to ensure the conservation of the habitats of wild flora and fauna species, especially those listed in Appendices I (rare plants) and II (animals). It also requires special attention to be given to the protection of areas of importance for migratory species (eg estuaries for internationally important waterfowl populations). The provisions of the Convention underlie the EC Habitats Directive (see above) as well as the UK's Wildlife legislation.

There are no sites identified as yet for protection specifically under the terms of the Berne Convention (see `Nature Conservation and Estuaries in Great Britain', Nature Conservancy Council 1991, for additional information).

Information from: DOE
SO
WO/CCW
ES:CW
Statutory designation: None

The Bonn Convention

The Convention on the conservation of Migratory Species of Wild Animals (the Bonn Convention) aims to provide a world-wide comprehensive system for the protection of all threatened migratory species of wild animal. It is designed to operate through a series of individually tailored, species related Agreement's between the countries concerned with the conservation of that species throughout its migratory range. Two Agreements on the conservation of bats and small cetaceans have been concluded.

Information from: DOE
SO
WO/CCW
ES:CW
Statutory designation: None

Sites of National Importance

National Nature Reserves (NNRs)

The statutory bodies have powers under section 19 of the National Parks and Access to the Countryside Act 1949 and section 35 of the Wildlife and Countryside Act 1981 to declare and maintain National Nature Reserves. They are sites which are usually chosen to protect habitats and associations of plants and animals rather than individual species. In many cases they may contain features of international as well as national significance. Sites which contain geological or physiographical features of special interest can also be declared NNRs. Many of these sites are irreplaceable as there are often no known sites of equivalent value elsewhere in the country. NNRs are usually notified in Wales and are all designated as such in England and Scotland as SSSIs. In addition, NNR status means that the provisions of section 296 of the Town and Country Planning Act 1990 or in Scotland section 253 of the Town and Country Planning (Scotland) Act 1992, as amended, relate to such land as though it were Crown land.

Information from: EN
SNH
CCW
ES:CW
Statutory designation: NNR and SSSI/ASSI

Volume 11 home page

Marine Nature Reserves (MNRs)

MNRs are designated under section 36 of the Wildlife and Countryside Act 1981, to conserve marine fauna and flora or geographical or physiographical features, or to allow study of such features. Following an application by the relevant statutory body, the Secretary of State for the Environment, Wales, Scotland or Northern Ireland, as appropriate, may apply such a designation to any areas of land covered (continuously or intermittently) by tidal waters, and to parts of the sea up to the seawards limits of territorial waters. The appropriate Secretary of State may also approve byelaws, under Section 37 of the Wildlife and Countryside Act 1981, introducing certain restrictions in such areas. The aim is to safeguard some of the best examples of marine wildlife habitats, with additional provisions for education, research and the legitimate uses of coastlines and shallow water.

Information from: DOE/EN.
SO/SNH
CCW
ES:CW
Statutory designation: MNR.

Sites of Special Scientific Interest (SSSIs) and Areas of Special Scientific Interest (Northern Ireland)

SSSIs/ASSIs are areas of land identified by the statutory bodies, in accordance with published guidelines, as being of particular value for their fauna and flora and geological and physiographic features. Their objective is to safeguard and enhance the characteristic plants, animals and physical features of our natural heritage. The SSSI/ASSI designation covers important sites for nature conservation including those of national and international importance.

SSSIs/ASSIs are designated under section 28 of the Wildlife and Countryside Act 1981. This Act requires the relevant statutory body to notify the appropriate Secretary of State, local planning authorities and the landowners or occupiers when a site is to become an SSSI/ASSI. The notification includes a description of the site's location, special interest and any operations which would be likely to damage that interest. Such operations can only be carried out under certain conditions - broadly, with the relevant statutory body's written consent, or under a management agreement, or after four months written notice has elapsed (provided that a Nature Conservation Order has not been made in respect of the site). Some operations will be acceptable if carried out at agreed levels, on certain parts of the site or at particular times of the year.

The assessment and notification of SSSIs/ASSIs is a continuing process since some sites may be denotified due to loss and damage, and other previously unrecognised areas may come to light. Government policy is that road schemes should be kept away from SSSIs/ASSIs wherever possible. When there is a risk that a proposed scheme will affect such an area it must be examined with particular care to establish that a new road is needed, and that the route has been chosen to do as little damage to the environment as practicable (1987 Roads White Paper, para. 5.1).

Information from: EN.
SNH
CCW
ES:CW
Statutory designation: SSSI/ASSI

Areas of Special Protection for Birds (AOSPs)

AOSPs are designated for bird protection by the Secretaries of State for the Environment, Wales, Scotland and Northern Ireland under section 3 of the Wildlife and Countryside Act 1981. Their purpose is normally to protect vulnerable groups of birds, although the protection given can vary to meet particular circumstances. AOSPs replace the previous Bird Sanctuary designations.

Information from: DOE.
SO
CCW
ES:CW
Statutory designation: AOSP.

Ancient Woodlands

Ancient woodlands are sites that are believed to have been wooded continuously since about AD 1600. Provisional lists of such sites are held by the appropriate statutory bodies, because of their high nature conservation value. Ancient woods that are still semi-natural, (ie are mainly composed of trees and shrubs native to the site which have not been planted) are particularly important. However, the lists also include those ancient woods that have been replanted.

Information from: EN.

Volume 11 home page

SNH
CCW and local planning authorities
ES:CW

Statutory designation: None.

Natural Heritage Areas

Under Section 6 of the Natural Heritage (Scotland) Act 1991, SNH may recommend to the Secretary of State for Scotland that an area which is of outstanding value to the natural heritage and for which special protection measures are appropriate, be designated as a Natural Heritage Area.

Information from: SO/SNH
Statutory designation : Natural Heritage Area

Sites of Regional or Local Importance

Local Nature Reserves (LNRs)

LNRs are designated by local authorities, in consultation with the relevant statutory body, under section 21 of the National Parks and Access to the Countryside Act, 1949. They may be sites which offer special opportunities for educational use and public enjoyment, in a locality, or sites which are managed to preserve flora, fauna, geographical or physiographical features of special interest in the area concerned.

LNRs can range in nature conservation value from SSSI/ASSI, or near equivalent, to being of reasonable nature interest in the local context. LNRs are usually maintained by a County Wildlife Trust, other ecological group or by the local authority. Their function is both site protection and public amenity and education.

Information from: Local planning authority.
Statutory designation: LNR

Regional Parks (Scotland)

Regional Parks are designated by Regional Councils, subject to confirmation by the Secretary of State for Scotland in case of objections. The designation was created by the Countryside (Scotland) Act 1981 and aims to allow the integrated management, by local authorities, of extensive areas of land.

Information from: Scottish Regional Councils
Statutory designation: None

Non-Statutory Sites of Importance for Nature Conservation

These are usually local authority designations for land use planning purposes. They afford no statutory protection but are recognised by local authorities and statutory agencies as being of local importance. Precise titles vary according to the planning authority in question, but typical examples are Site of Nature Conservation Importance (SNCI), Site of Scientific Interest (SSI), Site of Biological Interest (SBI), Site of Importance for Nature Conservation (SINC), Area of Scientific Interest (ASI), Area of Local Conservation Interest (ALCI), Sites of Interest for Natural Science (SINS) in the Grampion Region and Wildlife Sites, in Lowland Scotland.

Information from: Local planning authority.
Statutory designation: None.

Non-Statutory Nature Reserves

These are non-statutory sites set up and managed by County Wildlife Trusts, or other ecological groups such as the Royal Society for the Protection of Birds.

Information from: Local planning authority,
County Wildlife Trust
RSPB and Scottish Wildlife Trust

Statutory designation: None.

Forest Nature Reserves

These are non-statutory sites designated by the Forest Enterprise on their own land.

Information from: Forest Enterprise.
Statutory designation: None.

NON-DESIGNATED AREAS OF POTENTIAL NATURE CONSERVATION INTEREST

The presence of one or more of the features listed below may indicate that a site has potential ecological value.

- river or stream valleys and other wetland areas such as lakes, large ponds, reed beds and gravel pits;
- areas of permanent pasture and herb rich meadow;
- areas of deciduous and semi-natural coniferous woodland;
- farmland with a strong pattern of hedgerows, hill farming and crofting land;
- other wildlife corridors such as verges, embankments, old drove roads, disused railways and canals;
- lowland heath and scrub (eg juniper, gorse);
- bogs, fens and mires;
- moorland, narrow glens and mountainous areas;
- coastal habitats (eg estuaries, dune systems, salt marshes, cliffs and rocky shores);
- transition areas where habitat types change from one to another (eg woodland to grassland or grassland to moorland - these are known as ecotones);
- derelict areas which have been recolonised by plants and animals; or parks, gardens and open spaces, especially within urban areas;

In addition to the above, areas which have been designated primarily for their landscape value (eg AONBs, National Parks and National Scenic Areas) may, by virtue of their natural qualities, support a range of habitats and associated wildlife.

EXPLANATION OF THE RATCLIFFE CRITERIA

A. Fragility:

Some habitats, communities and species are particularly sensitive to environmental change. Such habitats tend to be rare, having been subject to past fragmentation. In some cases, fragile areas may be vulnerable to change distant from the site itself. For this reason, activities at sites distant from a fragile habitat should be considered for their potentially damaging effects eg drainage, stormwater run-off, and nutrient build-up (eutrophication). One example of a fragile site would be a marsh or bog, where the maintenance of the ecosystem would be dependent on the continuation of a particular water level and quality, as in the Somerset Levels and Norfolk Broads.

B. Rarity:

Rarity is one of the prime reasons for the establishment of protected areas. The threat of loss of a particular habitat or species lends value to the organism and the site it occupies. Rarity is also a matter of definition. A species or habitat can be internationally rare, but relatively common locally or nationally. Likewise, a nationally rare species can in some circumstances be more common at international level.

Rare species can be distributed in a number of ways. They can either be sparsely distributed within widely separated sites (eg the Dartford Warbler), or they can be widespread within a large area, but locally infrequent (eg the peregrine falcon). In addition some species are rare, but in the few locations where they occur, they may be found in large numbers (for example, the avocet). Whether a species has rarity value therefore depends upon the context.

C. Size (area or extent):

Size plays a major part in determining the ecological interest of an area. It is also a relative concept. For example, a 30 acre woodland or a one acre meadow could have a similar degree of nature conservation importance. An area of moorland or upland grassland would normally need to be more extensive to be of similar importance. This is in part due to the differing range requirements of species supported by these habitats.

A reduction in size of an area (eg through fragmentation) can reduce its nature conservation value considerably. An example of this is the Dorset heaths where, over a period of time, the heathland has been fragmented into increasingly smaller areas. At some point a size is reached below which the nature conservation value is lost because the range requirements of important species are no longer met. It is also worth noting that a site which has been divided in some way will not normally be able to support the same number and range of species as it did before fragmentation occurred. In the case of heaths, small sites may be occupied by more common and widespread generalist species rather than the true heathland specialists.

D. Diversity:

The diversity of a site can be expressed in three ways:

- as diversity of species (where the number and variety of species is great);
- as diversity of habitats (eg Thursley Common, Surrey, which contains heath, woodland, grassland and bog);
- as diversity of numbers (where a habitat is seen to support large numbers of one or more individual species). Morecambe Bay, for example, supports over a quarter of the country's winter population of oyster catchers, turnstones, knots and godwits.

Both low and high diversity have a high nature conservation value under different circumstances. High species diversity would be important for areas such as herb-rich grassland or ancient woodland, whereas low diversity would be an important attribute for moorland, heathland or reedbeds. It is not a question of the greater the diversity the greater the value.

E. Potential Value:

Some sites have the potential to provide greater nature conservation interest than presently exists. Examples of such sites, include abandoned quarries, mineworkings, spoil heaps, flooded gravel pits and low intensity agricultural land.

F. Position within the Ecological/Geographical Unit:

A site which is near or adjacent to other similar habitats may have a higher nature conservation value than an isolated one because the range of fauna can be greater. This is particularly so if the area is joined to adjacent sites by linear features which can act as wildlife corridors (eg hedgerows, verges, and riverbanks).

G. Typicalness:

When a site is viewed in the context of the local or regional area, certain habitats assume importance because they are good examples of what is, or has historically been, typical of the area. As a reponse to post-war habitat loss in Britain, efforts have been made to safeguard representative areas to prevent what was once common becoming fragmented or are.

H. Recorded History:

The history of a site is important, especially where it is to be used for research and education. A well documented past with detailed biological and/or natural history records of species and habitat change, presents a valuable insight into the ecology of the site. Such information also provides a basis for current and future management built upon knowledge of the past.

I. Naturalness:

Naturalness is a measure of the degree to which an area has been modified by human activity. In England, unmodified habitats are extremely rare or non-existent, being restricted to remote, inaccessible areas such as cliffs, and some saltmarshes. The bulk of England's land surface (and possibly all of it) is either semi-natural, improved or artificial. Naturalness is ascertained by site surveys which detail the species present (looking for key indicator species). In this way, an area can be valued according to the degree to which it represents the former natural landscape which was once present.

J. Intrinsic Appeal:

This refers to value in a popular rather than ecological sense. A host of golden daffodils in Wordsworth country can be as valuable as a colony of rare orchids in popular perceptions. This highlights the fact that value is also derived from society's preferences for landscape and other aesthetic features, and is not just based on ecological considerations.

PHASE 1 HABITAT SURVEYS

1. The aim of the Phase 1 Habitat Surveys is to provide a record of semi-natural vegetation and wildlife habitat over large areas of the countryside. Each survey consists of a field visit by an experienced ecologist, who maps the vegetation on a 1:10,000 Ordnance Survey map, using standard mapping codes. Topographic and substrate features are also recorded. Although the surveys do not include fauna, they can provide a good indication of existing habitats where varous species are likely to be found. In addition to the maps, target notes are produced which give a brief account of particular areas of interest. Statistics are also compiled on the extent and distribution of each habitat type. Ideally, the results are supported by a descriptive and interpretive report (this will not be true in all cases).

2. The origins of the Phase 1 Habitat Surveys go back to the 1970s. Many counties have now been surveyed to this level, mostly by County Naturalist Trusts, the Scottish Wildlife Trust and similar organisations (except in Wales where this is the responsibility of CCW), and the results are available for public use. These can be consulted at the offices of the local planning authority. Some reports are now quite old, or were not conducted to the standards which would now be required. It is therefore important to check the reliability of individual surveys with the relevant statutory body. In England, where a survey is still in preparation, EN are prepared to make the provisional results available to the Overseeing Department.

3. The methodology involved in preparing Phase 1 Habitat Surveys is suitable for recording specific habitats such as grasslands or woodlands, and whole areas in which every parcel of land is classified and recorded. The procedures are set out in the NCC publication `Handbook for Phase 1 Habitat Survey - A Technique for Environmental Audit'. Where a Phase 1 Habitat Survey has indicated the presence of a particularly important or valuable site, this may have been followed up by a more detailed Phase II or even Phase III survey. These focus on smaller areas in far greater detail, and may include data on animal species and communities.