

The Future of Sites of Special Scientific Interest (SSSIs)



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Photo courtesy of Countryside Council for Wales: Malltraeth Estuary, Anglesey, Gwynedd, SSSI.
Photo courtesy of P Wakely, English Nature: Sweet chestnuts, Fishpool Valley, Hereford, SSSI.
Photo courtesy of Lorne Gill, Scottish Natural Heritage: Glacial polished quartzite with the mountain ridge of Beinn Eighe NNR beyond, SSSI.

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Executive Summary

- 1 The Royal Society recognises the importance of the system of Sites of Special Scientific Interest (SSSIs) as a series of the best examples of our wildlife habitats and their geological features and landforms, and their crucial role in conservation. We also recognise the enormous potential resource they can provide for scientific research.
- 2 The current levels of resources accorded to the statutory conservation bodies and the Department of the Environment, Transport and the Regions (DETR) for co-ordination and implementation of regulations pertaining to SSSIs are insufficient in Wales, and may become insufficient in other areas following the introduction of new legislation. Given their importance, it is crucial that the Government provides adequate resources to the conservation agencies to enable them to identify and monitor sites. At present SSSIs are used extensively by the academic community for research, which often involves long-term monitoring. There are no formal linkages between researchers and the conservation agencies, and we recommend that the conservation agencies establish such links to ensure a scientific contribution and facilitate information exchange.
- 3 The majority of biological SSSIs are designated on the basis of relatively large and well-known organisms, such as birds, plants and larger invertebrates such as molluscs and large insects. There are far fewer cases of designations for less well-known groups such as fungi, soil micro-organisms and smaller invertebrates, although these groups may have a profound role in the ecosystem. We recommend that the conservation agencies seek strong input from universities, research institutions, museums and relevant learned societies so that the necessary scientific and taxonomic expertise can be brought to bear on these less well understood groups and species at a representative series of sites.
- 4 On earth science SSSIs, we recommend that a scheme be set up to identify near surface sites of national importance that are not presently exposed, but that may become so (at least temporarily) in the future through activities such as building work, road construction and quarrying. We also recommend that earth science SSSIs that are deemed to be of international significance should be identified as such, and then be monitored more closely.
- 5 As regards damage and monitoring, we recommend that in future English Nature (EN) and Scottish Natural Heritage (SNH) list damage continuing from previous years as well as new cases of damage (as the Countryside Council for Wales (CCW) does already) to give a clearer picture of damage overall, and that all the agencies identify the causes of damage where possible, underpinned by appropriate scientific research. We also recommend that all three agencies have sufficient resources to be able to report new and continuing damage occurring on their sites each year. Given the number of agencies and government bodies involved in the designation and monitoring of SSSIs, we recommend that the Joint Nature Conservation Committee (JNCC) should take the lead to ensure that common standards continue to apply across the system.
- 6 Marine conservation is a complex issue deserving of increased attention, and we commend the DETR's Review of Marine Conservation, which is due to report in 2001. We are nevertheless concerned at the lack of involvement of the scientific community in the review of marine biodiversity, and we strongly urge DETR to involve relevant scientific bodies in such reviews in future in addition to other interested parties such as non-governmental organizations (NGOs) with environmental interests and representatives of marine industries. We recommend that for any further reviews expert individual scientists and representatives of scientific bodies such as the Natural Environment Research Council, the Royal Society and other learned societies are invited to participate.
- 7 The Society recognises that considerable attention is being paid to the future of the SSSI scheme and to conservation issues in Britain in general. The SSSI scheme alone is insufficient to ensure that conservation in the UK is flexible enough to adapt to changing land use and climate change. There is much new legislation and the conservation agencies and other organisations are undertaking major new initiatives to improve the state of nature conservation in Britain. The Society welcomes their efforts, and strongly recommends that legislative measures to protect conservation, such as the Convention on Biological Diversity, be compatible with measures designed to combat climate change such as the Kyoto Protocol.

The Future of Sites of Special Scientific Interest (SSSIs)

Introduction

Sites of Special Scientific Interest (SSSIs) contribute to the conservation of our wildlife habitats and their geological features and landforms. This report considers whether current and pending processes are adequate in terms of designating and protecting SSSIs, issues of access and identification of sites, the criteria used for the selection and monitoring of sites, and considers policy implications and future challenges.

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1 What is an SSSI?

An SSSI is the designation by law of an area of Britain that is, in the opinion of the statutory agency concerned, of special scientific interest for its flora, fauna, geological or geomorphological features. Such areas may be large or small (eg, Bowland Fells in Lancashire is 16002.3 Hectares, whereas Horse Field, Gilling, North Yorkshire is 2.1 Hectares).

The three nature conservation agencies: the Countryside Council for Wales (CCW), English Nature (EN), and Scottish Natural Heritage (SNH) have a statutory duty to notify SSSIs. The Joint Nature Conservation Committee (JNCC) is the forum through which the three country conservation agencies deliver their statutory responsibilities for Great Britain as a whole, and internationally. These responsibilities, known as special functions, contribute to sustaining and enriching biological diversity, enhancing geological features and sustaining natural systems. The special functions are principally:

- to advise ministers on the development of policies for, or affecting, nature conservation in Great Britain and internationally;
- to provide advice and knowledge to anyone on nature conservation issues affecting Great Britain and internationally;
- to establish common standards throughout Great Britain for the monitoring of nature conservation and for research into nature conservation and the analysis of the results; and
- to commission or support research which the JNCC deems relevant to the special functions.

Whilst the nature conservation bodies have the responsibility for the day-to-day operation of the notification and monitoring scheme for SSSIs, the Department of the Environment, Transport and the Regions (DETR) has the overall responsibility for coordination and implementation of the legislation.

Anyone can propose a site for designation as a SSSI. Some proposals arise from specifically commissioned surveys, some commissioned by the conservation agencies, but not all. Those surveys can make recommendations which are reviewed by the conservation bodies. Each agency has its own procedure for review of notifications, from area advisory boards to independent experts on an *ad hoc* basis.

SSSI status provides protection through a mechanism of consultation about threats or activities which may endanger the special interest of a site. Designation of a site as an SSSI does not over-rule existing planning permissions. This study covered SSSIs only, namely sites in England, Scotland and Wales. In Northern Ireland the designation is Areas of Special Scientific Interest, and the legislation is defined in the Nature Conservation and Amenity Lands (NI) Order of 1985 (with 1989 amendment). This is similar to the Wildlife and Countryside Act of 1981 which provides for the protection of SSSIs (see Annex I).

The purpose of the SSSI system is described by DETR as 'to safeguard for present and future generations, the diversity and geographic and geomorphological features, including the full range of natural and semi-natural ecosystems and of important geological and physiological phenomena throughout England' (DETR public consultation paper on code of guidance on the operation of the new legislation in England *Sites of Special Scientific Interest: Encouraging positive partnerships*).

In the United Kingdom, the need to protect and enhance our habitats, species, natural features and characteristic environments has been recognised in legislation since the mid 19th century, when the first laws were introduced to protect wild birds. Since then a succession of Acts of Parliament, Statutory Instruments and other formal measures have been introduced to further nature conservation in the UK. These legal instruments are summarised in Annex I, along with European and Global instruments that also affect UK conservation measures.

The Site of Special Scientific Interest/Area of Special Scientific Interest designation is the main site protection measure in the UK. All terrestrial Biosphere Reserves, Natural Heritage Sites, Biogenic Reserves, Special Protection Areas, Ramsar Sites, Areas of Special Protection, Special Areas of Conservation and National Nature Reserves have first to be notified as SSSIs/ASSIs. Marine Special Areas of Conservation and Special Protection Areas are not underpinned by SSSIs, since the legislation only extends to mean low water, apart from estuaries. The process for notifying SSSIs is carried out by the conservation bodies and involves considering the site against a published set of criteria (see sections 2.1 and 2.2) followed by consultations with the owners and occupiers of the land, the local authority and the appropriate Secretary of State (or in the case of Scotland, the First Minister). All views on the proposed notification are considered. Once notified, protection of the site is achieved by agreements to compensate land owners or occupiers for profits lost as a result of not carrying out specified damaging operations. Increasingly, protection is being encouraged

through 'positive' site management agreements. However, for the minority of situations where both parties are not able to come to mutual terms of agreement, site management plans can now be enforced. In extreme cases there is provision for sites to be bought from the owner without their agreement. Around 8% of the total land area of Britain is designated as SSSI.

SSSIs were first introduced in legislation by s.23 of the National Parks and Access to the Countryside Act 1949, which required them to be notified by the conservation agencies. The Wildlife and Countryside Act 1981 strengthened the designation and it is anticipated that the system will be further strengthened by the Countryside and Rights of Way Act 2000 (CROW Act, which received Royal Assent on 30 November 2000). The CROW Act increases the conservation agencies' powers of entry to land and extends existing powers of compulsory purchase. There are also increased penalties for damage to an SSSI, by owners and occupiers and by other persons. The Act places new duties and greater responsibilities on statutory agencies and public bodies in respect of SSSIs and imposes restrictions on them when carrying out or authorising activities that affect an SSSI, details are provided in the DETR consultation document *SSSI: Encouraging positive partnerships. Public consultation paper on code of guidance. August 2000*. Although the penalties and restrictions have increased, there is a major move from a notice-based regime to a consent-based regime.

2 Selection of SSSIs

2.1 Biological sites

Biological sites are selected for their nature conservation interest. The rationale for site selection is set out fully in *Guidelines for selection of biological SSSIs; Nature Conservancy Council 1989*. Quality is judged by criteria given in *A Nature Conservation Review, Ed Ratcliffe 1977*. The criteria for the evaluation and selection of biological SSSIs, are: naturalness, size, rarity, diversity, fragility and typicalness as primary criteria, and recorded history, position in an ecological/geographical unit, with potential value and intrinsic appeal as secondary criteria. The last national-level review of UK biological conservation sites was the Nature Conservation Review, undertaken in the mid-1970s.

The aim of the SSSI series is to have a range of sites representative of UK habitats, assemblages of species or individual species (see Table 1). Some SSSIs have features in all these categories. In judging habitats, particular attention is given to the attribute of non-recreatability. Restoring the physical conditions of habitats is sometimes possible, but recreated habitats are regarded as inferior substitutes for the originals as it is difficult to restore the full and identical range of plant and animal species. For example, the biological character of some upland sites can depend on species that have been present since the end of the last glaciation and which would not return if the site were damaged. Likewise, woodland is often slow to acquire a full complement of species; in central Lincolnshire, woodland less than 400 years old normally lacks many characteristic species such as primrose, wood anemone, wood millet, wood-sorrel, early-purple orchid and small leaved lime. Nevertheless, simple preservation, ie, doing nothing, will often not ensure that the key values of a site are maintained.

Active management, and particularly the maintenance of long standing management practices is often required, eg, mowing or grazing of meadows or coppicing of woodlands. It is critical to identify and maintain the processes responsible for the desirable attributes and to maintain an appropriate level of intervention to sustain or enhance the key values.

An analysis of the most frequently cited features for English SSSIs shows that the criteria cited for selection are extremely diverse. The single most cited feature is invertebrate assemblage, usually of large insects. Some features can be recognised by almost anybody eg, reed swamp, but others require scientifically trained surveyors. Most biological SSSIs are designated on the basis of relatively large and well-known organisms, such as birds, plants and larger invertebrates such as large molluscs or insects. There are far fewer cases of designations for less well-known groups such as fungi, soil micro-organisms and smaller invertebrates, despite the profound role these groups may play within ecosystems, for example in recycling nutrients. Although these groups will be represented incidentally by the existing network, there is a lack of information about their contribution to biodiversity in this country and further information is needed to address this, for example: how many species of fungi and soil organisms are found at a site and across the country as a whole? Does the site network provide adequate representation for these groups? Identification and monitoring of less well-known groups is not possible during the short monitoring visits made by the conservation agencies, and we recommend the conservation agencies seek strong input from universities, research institutions, museums and relevant learned societies such as the Linnean Society, British Mycological Society and Society for General Microbiology so that the necessary scientific and taxonomic expertise can be brought to bear on these less well understood groups at a representative series of sites.

The number of sites notified solely for their individual species or particular species assemblages is surprisingly small (Table 1) – less than 10% of the total. The number of cited features per site varies widely, from a low of one, where a single species (most often a bat) is cited, to more than 40 features for complex SSSIs such as the Southport dunes (Sefton) and the Camel valley (North Cornwall).

Each of the UK conservation agencies notifies sites within their own country, which carries with it resource implications. We recommend that the Government ensures that the statutory bodies have adequate resources to carry out both notification and monitoring of SSSIs. For example, in the case of Wales, there is a backlog of notifications and an application for funding for this has been made to the National Assembly of Wales.

In summary, for biological sites, we recommend:

- **the conservation agencies seek strong input from universities, research institutions, museums and relevant learned societies such as the Linnean Society, British Mycological Society and Society for General Microbiology to provide the necessary scientific and taxonomic expertise on less-represented species at a representative series of sites;**
- **the Government ensures that the statutory bodies have adequate resources to carry out both notification and monitoring of SSSIs.**

Table 1. Numbers of biological SSSIs in England, Wales and Scotland in relation to types of features for which they are notified (data supplied by conservation agencies; 1999/2000 data sources – 2000 data subject to change)

Combination of features used to notify	England	Wales	Scotland
Habitat only	1220*	404	389
Habitat together with either or both of species or species assemblages	1220*	269	478
Species and species assemblages only	392*	59	84
Habitat or species plus earth science features	339	95	178
Total SSSIs with a biological feature	3171	827	1129
Earth Science SSSIs lacking biological features	917	173	319
Total SSSIs	4088	1000	1448

* Estimated by multiplying up from sample of 100; out of 100 representative sites there were 28, 28 and 9 respectively for the three categories of sites marked. The total number of sites covering these three categories was 2832. By dividing 2832 into the ratios 28:28:9, the figures of 1220, 1220 and 392 were reached

2.2 Earth science sites

The earth science sites aim to reflect the range and diversity of Britain's earth heritage. About one third of all SSSI sites in Britain have earth science features of interest. The criteria for designation are based on: international significance as reference sites and as sites central in the historical development of the earth sciences; sites containing exceptional features of scientific importance; sites containing features, events or processes that are representative of the geological history of Great Britain. The operational criteria for site selection are: minimum of duplication; and the possibility of conservation (Ellis *et al*, 1996). The selection of British earth science sites was carried out via the Geological Conservation Review (GCR, Ellis *et al* 1996). This review process aimed to identify all those sites necessary to build up an integrated and comprehensive picture of the full range of scientific features that constitute the geology and geomorphology of Britain, subject to the operational criteria above. The review involved several hundred scientists from higher education, government, industry, and the voluntary sector, and was completed in 1990. 3002 sites were identified from which it is envisaged that 2300 SSSIs will be designated when the process of notification is complete (the difference in numbers reflecting the fact that some SSSIs contain more than one GCR site). The results, describing the features of interest at each site, are currently being published in a set of 42 thematic volumes written by academics for a specialist scientific audience but with an introductory volume (Ellis *et al*, 1996) accessible to a wider audience explaining the basis of the review. Further details about the GCR are also available on the web:

<http://www.jncc.gov.uk/earthheritage/module/gcrhome.htm>

Although it is widely considered that the sites identified by the GCR provide adequate coverage of the most important earth science localities in Britain, there are concerns that the operational criteria used by the GCR preclude the recognition and inclusion of sites comprising stratigraphically important Quaternary sediments and other near-surface sites that have no surface exposures. We recommend that a scheme be set up to identify near-surface sites of national importance that are not presently exposed, but which may become so (at least temporarily) in the future through activities such as building work, road construction and quarrying. It is proposed that a national register of such 'sleeping sites' be compiled, backed up by a statutory safeguard that would allow field investigation,

logging and sample collection when they are exposed. This may be seen as similar in concept to the planning and policy guidance relating to archaeological investigations, but restricted only to certain key localities.

It is also a matter of considerable concern that there is no list of sites of international significance in earth science. Such sites include those that are reference localities, containing type examples of rocks, minerals, fossils, and time boundaries against which samples from all over the world are compared and/or dated. They also include sites that are regarded internationally as 'classic' landform examples; and sites that were formative in the historical development of the earth sciences (primarily geology and physical geography) as academic disciplines. The damage or loss of such sites would be a matter of international consequence. Accordingly, it is recommended that SSSIs that are deemed to be of international significance in earth science should be identified as such, and then be monitored more closely.

The most valuable earth science sites may be proposed as natural World Heritage Sites; if the 'Geoparks' programme currently being discussed within UNESCO emerges; this could be a further opportunity to recognise internationally important sites. Further information on the Geoparks proposal can be found at this web site:

<http://www.unesco.org/science/earthsciences/geoparks/geoparks.htm>

Among the earth science sites, there are differing susceptibilities to damage. Most geological SSSIs are less vulnerable to damage than are biological sites, but their conservation issues, while less complex, are nevertheless important. Moreover, soft Quaternary sediments and many geomorphological sites are particularly vulnerable to damage. Given the close associations at some sites between geomorphology and biological habitats, the impacts of damage can be compounded.

While it is recognised that the condition of earth science SSSIs is as closely monitored as that of the biological SSSIs, there has been a tendency in considerations of the future of the SSSI system, for the conservation issues presented by the former to be given less emphasis than those of the latter. This carries with it the danger that the position of earth science sites within conservation programmes could be undermined. Consequently, it is recommended that particular care be taken to circumvent

this danger in the framing of the wording of consultative documents on environmental conservation and in any legislation that follows.

The Geological Conservation Review outlined above selected sites on the basis of national importance. However, in 1990 the Nature Conservancy Council set up the Regionally Important Geological and Geomorphological Sites (RIGS scheme) to identify further sites of local or regional interest using nationally agreed criteria. The RIGS scheme is detailed at <http://www.rigs.org/rigsrigs.html>. Local groups involved in this system operate on a voluntary basis. Although RIGS lie outside statutory protection, they can be listed in local authority development plans and can be protected through the planning system, if this is recommended by a RIGS group. This is analogous to local nature reserves and their relationship to voluntary groups such as wildlife trusts. The value of local sites, whether RIGS or nature reserves, and their role in consideration of conservation issues is not as widely publicised or understood as it might be. It is recommended that their value be emphasised as a useful tool for involving the local community, both lay and scientific, in conservation issues and that, where appropriate, this be linked to local Biodiversity Action Plans.

In summary, for earth science sites, we recommend:

- **that a scheme be set up to identify near surface sites of national importance that are not presently exposed, but which may become so (at least temporarily) in the future through activities such as building work, road construction and quarrying. It is proposed that a national register of such 'sleeping sites' be compiled, backed up by a statutory safeguard that would allow field investigation, logging and sample collection when they are exposed;**
- **that SSSIs that are deemed to be of international significance should be identified as such, and then be monitored more closely;**
- **that particular care be taken to circumvent the undermining of earth science sites in the framing of the wording of consultative documents on environmental conservation and in any legislation that follows;**
- **that the value of RIGS be emphasised as a useful tool for involving the local community, both lay and scientific, in conservation issues and that, where appropriate, this be linked to local Biodiversity Action Plans.**

3 SSSIs: monitoring and status

3.1 Monitoring

Most SSSIs are judged not to require compensatory management agreements to secure their protection. However, the revised financial guidelines under the CROW Act will provide incentives for positive work. Site management schemes remain an option where voluntary approaches fail. The Site Management Statement is a convenient means for specifying the ideal conservation strategy. The list of Operations Likely to Damage, which forms part of a notification, ensures that all parties (visitor, landowner, conservation agency) know exactly what constitutes site damage at a particular site (eg, on many earth science sites, taking rock samples would not constitute site damage despite appearances to the contrary). Site owners

should not be solely relied upon for development of management plans - they will need to develop these in conjunction with other expert bodies. The amount of scientific input needed will depend on the nature of the site, and it will be up to the designating agencies to decide and organise this, possibly by involving local Wildlife Trusts etc, who usually have good links to the academic community in the area. Management plans will also require specialist input of a non-scientific nature; science should underpin the advice of specialists rather than be applied to the plans directly, since many research programmes undertake long-term study of SSSIs as part of their research. There should be adequate resourcing of statutory bodies for monitoring of SSSIs.

More use could be made of academics in monitoring the condition of sites; scientists who visit a site could report back semi-formally on the condition of the site. The nature conservation agencies could invite appropriate fieldwork officers from relevant university departments and research institutes (as appropriate to the types of sites) to provide annually a list of SSSIs visited during field programmes with comments on any changes in the condition of the sites. This would not be an onerous task for fieldwork officers, and would have the further twin benefits (1) of ensuring that those engaging in fieldwork are fully aware of where the SSSIs are in their field areas, and (2) of providing data about which SSSIs were most heavily visited for research and teaching purposes. The nature conservation agencies currently contract out some monitoring where the expertise of the agency employees is deemed insufficient. We recommend that the agencies continue to contract out such work and maximise the use of scientifically trained contractors within the constraints of the resources available and utilise ongoing university field work as outlined above.

Local RIGS groups and wildlife trusts could also play a valuable role in monitoring the condition of sites provided they too are fully cognisant of the agreed conservation strategy for each of the sites they are 'monitoring'.

In summary, for monitoring, we recommend:

- **there should be adequate resourcing of statutory bodies for monitoring of SSSIs;**
- **more use could be made of academics in monitoring the condition of sites; scientists who visit a site could report back semi-formally on the condition of the site.**

3.1.1 Biological sites

Some qualifying features are easy to observe on a single visit to an SSSI notified for biological importance. In particular, much monitoring is based mainly on plant attributes. The system for doing this, known as Common Standards for Monitoring Designated Sites, uses attributes that indicate whether the qualifying features are likely to be enhanced or maintained. These indicators are often not the qualifying feature itself. Monitoring needs to identify change and the basis for that change, and any use of surrogate indicators should be defensible.

3.1.2 Earth science sites

For the purpose of outlining conservation strategies, earth science sites are classified as either integrity sites, ie, sites which contain 'finite deposits or landforms which are irreplaceable if destroyed' (Ellis, *et al*, 1996); or as exposure sites that are extensive exposures of rock or sediments such as may be found, for example, in quarries, cliffs, mines, and stream sections.

Within the framework of integrity/exposure sites, general conservation principles have been defined to provide guidance to conservationists as to the likely threats that may affect them. In recognition of the finite and irreplaceable nature of the integrity sites, a more protective approach for such sites is needed. But in all cases the specific conservation strategy for a site must be devised on a site-specific basis.

3.2 Site condition and damage

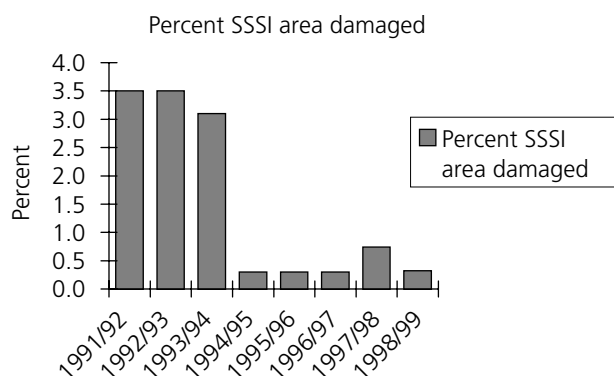
Recent years have seen media concern over the poor condition of SSSIs and some high profile cases have strengthened these fears. Information on the condition of SSSIs comes from data published in the annual reports of EN, SNH and the CCW. The annual reports list all damaging activities occurring on SSSIs under the jurisdiction of the relevant agency during the year. Reported cases are classified according to the cause of damage, whether recovery is likely, and if so whether it will be short- or long-term (>3 years). For England and Scotland the reported damage only covers new damage that was not reported in previous years; CCW lists damage continuing from previous years as well as new cases of damage, and we recommend that the other two agencies also do this in future to give a clearer picture of damage overall. In addition, the damage listed is not exhaustive, particularly with regards to gradual deterioration due to lack of positive management through neglect of processes that maintain the features, and the causes of damage should be identified as precisely as possible. For example, 'agriculture' should be broken down into, for example, sheep grazing, fertilizer use, etc. This will enable future corrective measures to be targeted more effectively and also enable the efficacy of current corrective measures to be assessed properly.

Criticism of the *ad hoc* nature of damage reporting led to a new approach, adopted under the heading of Common Standards Monitoring in 1998 (see section 3.1.1). As a result, since the 1996/1997 report, English Nature have published details of the overall condition of sites based on a monitoring program that samples nearly half of all sites annually, with each site visited no less than once every six years. The monitoring program assigns each site visited into one of five categories, based on the condition of the feature of interest for which the site was notified: favourable, unfavourable improving, unfavourable no change, unfavourable declining, and destroyed/part destroyed. Data are available in terms of percentage of sites and percentage area in each category. This approach provides a more objective assessment of the overall state of SSSIs, but comparable data is not yet available for Wales or Scotland where the process is just starting. In addition, it is still important to determine the causes of poor condition. We recommend that all three agencies have sufficient resources to be able to report new and continuing damage occurring on their sites each year. Establishing cause and effect may be difficult from observational site monitoring alone and we recommend that scientific research be conducted to identify reliable symptoms associated with major causes of damage. The Royal Society has recently recommended that the Ministry of Agriculture, Fisheries and Foods (MAFF) fund research into causes and possible solutions for damage to protected sites resulting from agriculture.

A high proportion of SSSIs are in poor condition. In England, since the start of the Common Standards Monitoring program, around 30% of 'habitat type' sites have been in unfavourable condition and not improving. However, the condition of the

network as a whole appears to be improving gradually rather than deteriorating (see Table 2). On balance, in any given year, the proportion of sites that are unfavourable but improving exceeds the proportion that are unfavourable but deteriorating. The proportions of sites in each category have remained largely constant over the four years since condition-reporting began, the only change being a slight increase in the proportion of sites improving from unfavourable conditions, with a comparable decrease in the number of sites that are unfavourable without change. In a more detailed analysis of year-on-year change across 2,127 sites, reported in the 8th Annual Report from EN (1998/1999), twice as many sites changed for the better as changed for the worse. Similar data are not yet available for other regions, but the pattern appears to be consistent throughout the UK. For example, from 1996/97 to 1998/99 in Wales, the proportion of sites affected by ongoing damage within each year is high, at over 20%, but fell slightly over the period.

Table 2. Percentages of area of SSSIs in England damaged from 1991-1999 (Data provided by English Nature)



Despite signs of overall improvement in the SSSI network, the situation for the biological sites varies markedly among habitat types. EN's 9th Annual Report (1999/2000) provides data for 18 broad habitat types, based on a sample comprising one third of all sites. In five habitat types the proportion of represented area in unfavourable condition and not getting better, exceeds the proportion in favourable or recovering condition: upland calcareous grassland, bogs, rivers and streams (see section 5), upland heathland and upland acid grassland. Representation of these habitats may be expected to deteriorate over time unless their management improves. All five habitats represent fairly open, unenclosed habitats that are susceptible to outside influences, such as pollution from catchment areas in the case of rivers and streams, or unfettered grazing in the case of the upland areas. Their poor condition reinforces the view that site-based approaches may be failing for such habitats, and that holistic approaches taking into account the wider ecological context of each site may be needed (see section 6.1). Upland neutral grassland, which tends to be enclosed, is in much better overall condition than upland acid or calcareous grassland. The habitats in best overall condition are intertidal and mainland rock, and lowland woodland and grasslands. The latter habitats may comprise discrete units more amenable to site-based management and protection. Areas of rock may be protected by their limited use for agriculture (see below). It is also worth noting that heathland can suffer from nutrient enrichment and therefore loss of the valued species through diffuse pollution,

derived from nitrogen oxides and volatile organic compounds etc, for which site-based remediation is impractical.

The biggest cause of poor condition in SSSIs across the UK is agricultural activity. Of the sites reported by EN to have been newly damaged between 1996/1997 and 1998/1999, summarised in Figure 1, 35% of cases were the result of agriculture, affecting 90% of the total area damaged. A further 15% of sites (2% area) suffered from insufficient management, often interlinked with agricultural practices. A similar but less extreme pattern is found in Scotland, with 29% of cases caused by agriculture, affecting 54% of the area damaged (the category of insufficient management is not used in Scotland). These figures probably reflect a minimum estimate, since reported damage underestimates the number of sites suffering from gradual deterioration. For example, for all sites experiencing damaging activities in Wales during 1998/1999, which includes sites suffering ongoing damage as well as new cases of damage reported in the year, over two-thirds of sites were damaged by agriculture (Figure 2); area of damage not reported. Overgrazing of upland areas is a major factor contributing to this pattern.

After agriculture, miscellaneous activities such as drainage, peat digging, fire, and damage by unknown third parties are the next biggest cause of damage. Direct habitat destruction by development affects a smaller proportion of sites. Individual cases may be high-profile and result in serious (often permanent) damage, but only 15% of sites damaged in England from 1996/1997 to 1998/1999 were affected by development (5% of the total area damaged). Similar figures apply in Scotland. In Wales, only 6% of sites suffering new or ongoing damage during 1998/1999 were affected by development. Particular categories of sites may be more affected by development, most notably Earth Heritage sites. Overall the pattern of damage suggests that the greatest benefits to the overall quality of the SSSI network would be achieved by tackling agricultural policy and land management. We welcome the forthcoming review of agri-environment schemes by DETR, announced in their recent Rural White Paper *Our Countryside: the future. Fair deal for rural England*. The review will aim to reshape and simplify the schemes, and will be seeking a further shift of the EU Common Agricultural Policy in the longer term towards support for farmers to farm in ways that positively enhance our wild fauna and flora. We support systems put in place by MAFF to protect Environmentally Sensitive Areas (ESAs), however we note that there is little correlation between these systems and the SSSI designation. In particular, areas singled out for ESA protection (heather moorland, species rich grassland, lowland heath and biologically diverse field boundaries) do not include other habitats under threat (eg, freshwater ecosystems, coastal/marine habitats, ancient woodlands and some morphologically important areas). We recommend that conservation related initiatives by MAFF are pursued in discussion with other interested parties, particularly the scientific community, to ensure complementarity with other measures.

In summary, although the situation may be improving overall, a large proportion of sites are in poor condition, and representation of specific habitat types appears to be deteriorating. There may also be specific problems with some categories of site. Changes to agricultural practices will be a factor in speeding up improvements in the condition of the SSSI network. Monitoring the condition of SSSIs, including

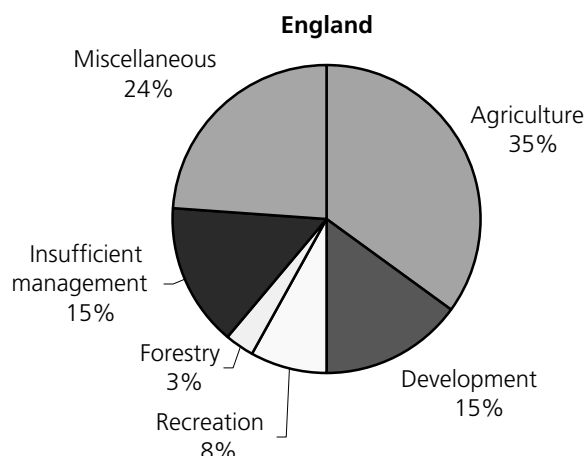
recognition of the differential vulnerability within geological and geomorphological sites is vital for improving the effectiveness of the system. Establishing the cause and effect of poor condition and its proposed treatment would benefit from greater input from the scientific community. We welcome DETR's announcement in the Rural White Paper *Our Countryside: the future. Fair deal for rural England* that they have set themselves an ambitious target of ensuring that 95% of the nationally important sites (SSSIs) in England are in favourable condition by March 2010. Given the number of agencies and government bodies involved in the designation and monitoring of SSSIs, we recommend that the JNCC should take the lead to ensure that common standards continue to apply across the system.

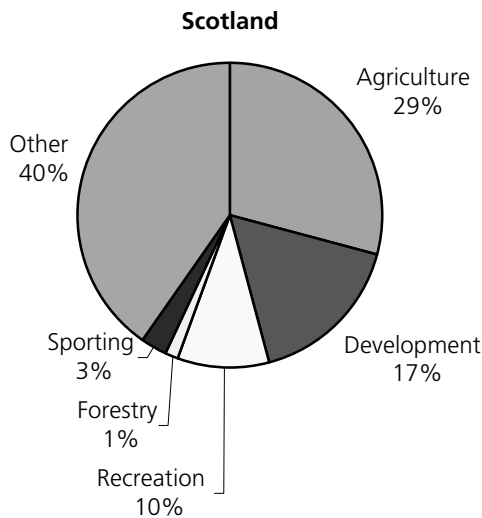
Sites should not be allowed to degrade. Whilst it is preferable to restore sites if possible, if the characteristics for which they were notified are lost or impossible to restore, as a last resort they should be denotified so that resources can be redirected to other sites and so that the integrity and credibility of the system is maintained.

In summary, for site condition and damage, we recommend:

- that EN and SNH list damage continuing from previous years as well as new cases of damage in future to give a clearer picture of damage overall, and that all the agencies identify the causes of damage where possible;
- that all three agencies have sufficient resources to be able to report new and continuing damage occurring on their sites each year;
- establishing cause and effect may be difficult from observational site monitoring alone and we recommend that scientific research be conducted to identify reliable symptoms associated with major causes of damage;
- that conservation related initiatives by MAFF are pursued in discussion with other interested parties, particularly the scientific community, to ensure complementarity with other measures;
- given the number of agencies and government bodies involved in the designation and monitoring of SSSIs, we recommend that the JNCC should take the lead to ensure that common standards continue to apply across the system.

Figure 1 Causes of damage to sites that were reported as newly damaged in England and Scotland between 1996-99 in terms of percentage of damaged sites falling in each category.





Note that categories differ between the two regions (source: annual reports of English Nature and Scottish Natural Heritage).

Figure 2 Causes of damage to all sites experiencing new and ongoing damage in Wales during 1998/1999, expressed as percentage of damaged sites falling in each category. Note - 1999/2000 report only has data per area



4 Access to SSSIs

4.1 Access to information

Public access to information about matters subject to public expense is a fundamental principle. Consequently, easily accessible information sources listing all SSSIs and providing certain key pieces of information about each one should be readily available, except where there is a clear need to protect fragile sites, for example from mineral, fossil and plant collectors.

Access to information about the SSSI network is also vitally important, for scientific research as well as for general interest purposes. There are good internet-based databases and maps of SSSIs and other sites, some of which are provided by environmental NGOs (for example Friends of the Earth), but there is no central point of access to such information. The JNCC provides valuable information on specially protected areas and other sites (<http://www.jncc.gov.uk/idt/sac/sitelist/>), and the other conservation bodies provide some information on nature reserves, etc (<http://www.english-nature.org.uk/>; <http://www.cw.gov.uk/designat/english/ssi.htm>;

<http://www.snh.org.uk/index/i-frame.htm>) but we recommend that DETR and the conservation bodies work together to produce an easily accessible central access point which explains the SSSI system and provides details of designated sites. Such a site should be provided by the designated authorities so that there is an official source of web-based information that is free from misinformation and sensitive to landowner concerns. Key pieces of information that ought to be easily available on each site include (i) concise but more informative guides as to why the site is of scientific significance, (ii) site notification dates, (iii) when the site was last assessed, and (iv) a statement, agreed with the landowner, about access rights to the site, and what is deemed to be reasonable activity or behaviour there (including contact information).

4.2 Access to sites

A large proportion of SSSIs are owned privately and therefore designation of a site as an SSSI does not confer automatic public right of access to it. However, increased promotion of the public understanding of sites should be encouraged, and an important factor in so doing will often be public access to SSSIs (or parts of them). In particular involvement of local interest groups, or schools and colleges, could play an important part in raising awareness of the SSSI system. There is however an obvious possible conflict between promoting full, open access to the public for all SSSIs, for recreational purposes, research and education, and allowing for restricted access, especially to sites that are ecologically very sensitive, or where landowners may legitimately object to open access to their land. Access to SSSIs here includes public rights of way. What constitutes a reasonable level of access is a matter that can best be agreed between the statutory nature conservation bodies, who can advise on the impact of access to these sites with regard to their nature conservation value, and landowners, as a formal part of the Site Management Statement. For sites that are particularly sensitive, either scientifically or for reasons connected with the landowner's activities, there seems to be no reason (other than the resource implications in administering this notion) why access should be allowed only by written permission from the landowner. Some agencies are currently taking steps to increase promotion of SSSIs, and access to them, whilst Part 1 of the CROW Act also proposes general widening of access. **We recommend that the relevant government departments, conservation agencies and private landowners work together to promote access to sites and increased public awareness of the SSSI system.**

5 Aquatic sites

This section addresses examples of particular problems faced by aquatic sites.

5.1 Freshwater sites

Freshwater habitats in parts of Great Britain are poorly represented in the SSSI system, especially fluvial systems. This is partly because our knowledge of biodiversity in these ecosystems is limited, with most sites being notified on the basis of a few plant or fish species that are likely to be rare. Therefore, because many sites are designated on the basis of relatively few species, (i) the overall quality of the habitats is often overlooked, and (ii) other freshwater sites may fail to qualify as SSSIs because they lack the specific criteria, whilst assemblages of other

important organisms, eg, aquatic invertebrates, remain overlooked. There is a general consensus that greater resources are needed to increase our science base knowledge of these ecosystems by monitoring and scientific research. Furthermore, freshwater SSSIs are especially vulnerable to environmental impacts outside their boundaries, for example from agricultural processes in the catchment area, industrialisation and extraction of water. Agricultural processes are perhaps the biggest danger to freshwater SSSIs, as legislation here is currently weak. This will be strengthened by the CROW Act, which we welcome. Overall, published research on freshwater quality in the UK is conflicting and potentially misleading. A survey of freshwater SSSIs by Carvalho *et al* (1995) found that up to three-quarters were affected by eutrophication, whilst many other freshwater bodies in acid-sensitive regions show indication of damage by acidification (Rimes *et al* 1994). A recent (21 September 2000: *UK river quality breaks new record*) press release by the DETR however, highlights that river water quality in the UK is better than ever before (as a result of substantial investment by water companies in sewage disposal, tougher regulation and enforcement, and greater pollution prevention by the Environment Agency (EA). The EA classifies water quality using their General Quality Assessment (GQA) on the basis of only three chemical determinants: biochemical oxygen demand (BOD), and concentrations of dissolved oxygen (DO) and of ammonia. There are many other forms of pollution (eg, heavy metals, and nutrients such as phosphates and nitrates) that are not covered by these criteria, leading to an almost certain under-estimation of the extent of damage presented to the public (Moss 1997).

Concern over freshwater habitats has recently led MAFF to promote their pilot *Habitat Scheme*, aimed at creating or enhancing valuable habitats by taking land out of agricultural production. Three habitat types are currently being targeted, including water fringes in six designated areas. These create buffer strips or extensively grazed fields alongside the designated watercourses and lakes. In this scheme the use of fertilizers and pesticides is prohibited and active management of ponds and reedbeds required. (The other two types of habitat are farmland previously in the Five Year Set-Aside Scheme and coastal saltmarshes.) The MAFF web page can be accessed at <http://www.maff.gov.uk/>.

Although additional protection for freshwater SSSIs is likely once the EC Water Framework Directive is implemented, other schemes such as the local environment action plans and catchment abstraction management plans remain as yet unproven. Finally, freshwater sites and their catchments need to be considered together, rather than as separate entities. This would be most effectively done under the 'ecosystem approach' adopted by the Convention on Biological Diversity (see section 6.1) (eg, EN's *Lifescapes* project, which emphasises the need for action to deliver wildlife within landscapes, and to highlight that biodiversity is related to quality of life).

5.2 Marine sites

As the SSSI system is based on notification of owners and occupiers of sites, and subsequent management by them, it is fundamentally unsuitable for the protection of marine sites, where neither owners nor occupiers exist. Indeed marine sites cannot be SSSIs, as SSSI legislation does not extend below mean low water, apart from some estuaries. It would require

wholesale changes to the legislation to adapt the SSSI system to the marine situation, and we do not regard this as a constructive way forward. The European Habitats Directive does however provide for the designation and protection of marine sites as Special Areas of Conservation (SACs), and we endorse the efforts being made by both government agencies and NGO's to pursue this option. The Birds Directive also allows for designation of Special Protection Areas, which may also be applicable in the marine situation.

The DETR has established a Review of Marine Nature Conservation, following its recent consultation on the future of SSSI's. In the light of the long-standing problem of finding an effective means of protecting marine ecosystems, we commend this important initiative, which is due to report in 2001. NGOs with environmental interests are participating in this review, but scientific bodies have not as yet been invited to contribute directly. **We recommend that for any further reviews, expert individual scientists and representatives of scientific bodies such as the NERC, the Royal Society, and relevant specialist societies (the Challenger Society for Marine Science, the Marine Biological Association, the Scottish Association for Marine Science, the Society for Underwater Technology, etc), should be invited to participate.** We recognise, however, that there is a serious, long-standing difficulty that has to be overcome, namely the probable need to restrict fishing effort within marine protected areas such as SAC's. Close consultation with fishermen's organisations will be necessary to avoid the potential conflict with fishermen whose traditional and hitherto legal activities are likely to be curtailed. It would be helpful if a synergy can be established between current interest in the use of closed areas ('no-take zones') for fisheries management, and the requirements for conservation of marine resources, habitats, and biota other than fish. Finally, we note that an ecosystem approach (see section 6.1) is likely to be needed in the identification of marine 'sites' or areas requiring protection.

6 Future challenges

6.1 Ecosystem approaches

A common theme throughout this report has been the importance of taking an ecosystem approach to nature conservation. Natural systems comprise a dynamic complex of plant, animal and micro-organism communities together with the non-living environment, and the functional relationships among these different units are a vital component of our natural heritage. Many current approaches take the necessary practical step of using particular species or units as surrogates for overall diversity, but increasingly it is apparent that more holistic approaches will be needed to preserve functional natural systems. This view has been widely endorsed in reviews of conservation measures, for example, the Convention on Biological Diversity (CBD), an international treaty that was negotiated under the auspices of the United Nations Environment Programme (UNEP), finalised in June 1992 and entered into force in December 1993. Practical implementation of an ecosystem approach remains complicated. The theme of ecosystem management has recently become a key focus for many organisations and structures, including UNEP, and the World Commission on Protected Areas and the Commission on Ecosystem Management of IUCN - The World Conservation Union. An important workshop on this topic was held in Scotland in April 1999 (Crofts *et al*, 1999).

The ecosystem approach does not preclude other management and conservation approaches, such as biosphere reserves, protected areas, and single-species conservation programmes, and we recommend in this report that an ecosystem approach increasingly be taken in future. Previous sections highlighted systems in particular need of this approach, for example, when designating freshwater SSSIs, as catchment influences and geomorphological processes are important when considering water quality and the preservation of species. In recognising the importance of interaction between the biological and the non-biotic components, the ecosystem approach encourages joint consideration of the biological, geomorphological and soil attributes and processes of sites and their surrounding areas. This will almost certainly require some reconsideration of the criteria for designation.

Two issues need to be tackled to implement the ecosystem approach. First, we need more research detailing the interactions among units of natural systems and how the functional whole is likely to change in response to changes in management or climate (see section 6.2). Second, the ecosystem approach is likely to require adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. The management programme must be sufficiently flexible to respond to the availability of new data. Precautionary measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically. Both issues require much stronger interaction between the scientific research community, conservation agencies and policy makers.

6.2 Climate change

Perhaps one of the greatest scientific and management challenges for the UK government and statutory nature conservation bodies is how to maintain current designated sites in the face of continuous climate change. Change is a common feature of natural systems, but anthropogenic climate change, such as global warming, raises the possibility of large-scale changes in species composition and site landscapes over short time-scales (eg, major changes in sea level). The likely implications of climate change link directly to legislative approaches. The problem is how to preserve biodiversity as a whole while allowing for the inevitable changes at a site level. The question then becomes how can we allow for species level changes at specific locations while also preserving diversity as a whole?

A recent report commissioned by the DETR (October 2000) has reviewed the impact of climate change on habitat conservation policy. It recognises that the strict delimitation of SSSIs will be problematic as species' distributions change in response to climate change and acknowledges the need for a flexible designation system. However, many of the ecological processes that govern species and landscape change in response to climate changes remain unknown. A number of areas of uncertainty are outlined in the report for DETR and include the need to understand the speed of response to climate change in vulnerable habitats and best management practices to encourage the climate-mediated movement of habitats and species within the wider countryside. The conservation bodies cannot be expected to meet the growing scientific challenges alone. **Stronger links with universities, scientific research institutions and independent bodies carrying out fundamental research and applied modeling of the likely impacts of global change within the UK, are therefore needed to help define conservation and management strategies over the next decade. It is also vital that legislation designed to address climate change, such as the Kyoto Protocol, is compatible with that designed to further conservation such as the CBD.**

Because climate changes are likely to be felt across continental scales, cooperation between researchers, policy makers and funding agencies is required at a European level. One step towards this is an informal 'European platform for biodiversity research strategy' which has recently been set up by the European Commission Directorate General for Research. This provides the opportunity to discuss strategic issues relating to biodiversity research in Europe, and will permit the exchange of information on national biodiversity activities, relevant research and current best practices. Its membership comprises researchers and policy makers from each Member State along with Commission Officials. This new Forum may influence discussion of UK site protection measures in the wider European context. The recent House of Lords report on Biodiversity in the European Union (22nd report, 2000) recommended a forum of statutory nature conservation agencies within the EU, and the two fora could usefully work together.

The Society recognises that considerable attention is being paid to the future of the SSSI scheme and to conservation issues in Britain in general. There is much new legislation and the conservation agencies and other organisations are making major new initiatives to improve the state of nature conservation in Britain. The Society welcomes their efforts.

Glossary

Assemblage – a group of species occurring together in the same eg, habitat

Biodiversity – the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems

Biosphere – that part of the earth (upwards to at least 10000 metres and downwards to the depths of the oceans and a few hundred metres below the land surface) and the atmosphere surrounding it, which is able to support life

Calcareous grassland – grasslands growing in limestone or chalk substrates

Earth heritage sites – sites selected by the Geological Conservation Review as ultimately satisfying the legal requirements for notification as an SSSI by reason of their geology or geomorphology

Earth science – sciences including geology and physical geography (which includes geomorphology) that encompass study of the earth

Ecosystem – a set of interacting, interdependent, living organisms and their physical, biological and chemical environment – the total of the external conditions that surround an organism, community or object

Eutrophication – nutrient enrichment of ecosystems

Fluvial – pertaining to rivers or river action

Geography (physical) – study of the earth's surface and the environment within which organisms live

Geological Conservation Review – a survey conducted 1977-1990 at the instigation of the Nature Conservancy Council, to identify sites necessary to show key scientific elements of the earth heritage of Britain

Geology – study of the earth's crust, rocks and strata

Geomorphology – study of the landforms comprising the earth's surface and the processes that give rise to them

Habitat – the physical or natural environment within which a species is normally found

Intertidal – The shoreward fringe of the seabed between the highest and lowest extent of the tides

Near-surface site – any site that becomes exposed through human construction activities

Neutral grassland – grassland whose soil pH is in the range 5.5-7.0, which is typically enclosed and used for hay production or for holding and pasturing livestock in winter

Quaternary – The past two million years of geological time (during which Britain suffered substantial and repeated climate changes)

RIGS – Regionally Important Geological and Geomorphological sites – supplementary to GCR, not under statutory protection

Site of Special Scientific Interest – a conservation mechanism that confers legal protection on sites; the main site protection mechanism in the UK

Type locality – the exact geographical site at which the type of a nominal species or sub-species was collected

Upland acid grassland – grassland of the Highland zone of Great Britain on soil with pH<5.5

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British Geomorphology Research Group; Country Landowners Association; Countryside Agency; Countryside Commission; Countryside Council for Wales; Department of the Environment, Transport and the Regions; English Nature; Environment

Agency; Environment and Heritage Service, Northern Ireland; Environmental Change Research Centre; Geological Society; Joint Nature Conservation Committee; Marine Conservation Society; Ministry of Agriculture, Fisheries and Food; Quaternary Research Association; Royal Agricultural Society of England; Royal Geographical Society with IBG; Royal Society of Edinburgh; Scottish Natural Heritage; The Broads Authority; World Wide Fund for Nature, UK.

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ANNEX I Measures for conservation

Notes: (1) in respect of Scotland, following devolution, the Secretary of State should read the First Minister; (2) that the designating body as outlined below is responsible for providing guidance on designation and on enforcement of statutory legislation where such legislation exists.

Type of protection	Designating body	Associated statutory instrument	Notes
Estuary Fora	Local authority + others	n/a	England, Wales
Firths fora, Area sustainability Strategies	Scottish Natural Heritage (SNH) Scottish executive + others	n/a	Scotland
Forest Nature Reserves	Forestry Commission	n/a	UK
Forest Park	Forest enterprise	n/a	UK
Heritage Coast	Countryside Commission/Countryside Council for Wales (CCW) + local authority	n/a	England, Wales; sections of coast exceeding 1 mile in length that is of exceptionally fine scenic quality, substantially undeveloped and contains features of special significance and interest
'non-statutory nature reserve'		n/a	UK
Regionally Important Geological and Geomorphological Sites (RIGS)	Set up by Nature Conservancy Council	n/a	Sites of local or regional interest; can be listed in local authority development plans
Sensitive Marine Area	English Nature (EN)	n/a	England; nationally important marine areas and notable for their marine animal and plant communities or which provide ecological support to adjacent statutory sites
Marine Consultation Areas	SNH	n/a	Scotland; areas deserving particular distinction in respect of the quality and sensitivity of the marine environment within them
Geological Conservation Review sites	Country Agencies	n/a	Non-statutory sites identified by nature conservation agencies as having national or international importance on the basis of geology, palaeontology, mineralogy, or geomorphology
LOCAL AUTHORITY			
Country Park	Local authority	Countryside Act 1968. Countryside (Scotland) Act 1967	UK; primarily intended for recreation and leisure opportunities close to population centres and do not necessarily have a nature conservation interest

Type of protection	Designating body	Associated statutory instrument	Notes
Local Authority Nature Reserve	Local authority	Wildlife (Northern Ireland) Order 1985	Northern Ireland (NI)
Local Nature Reserve	Local authority	Amenity Lands Act (Northern Ireland) 1965 National Parks and Access to the Countryside Act 1949.	UK–NI;
Limestone Pavements	Local authority or Secretary of State	Wildlife and Countryside Act 1981	Limestone Pavement Orders are created by the relevant local government authority or Secretary of State and prohibit the removal or damage of limestone within a designated area
Regional Landscape Designation	Planning authorities		UK; identifies sites there should be a strong presumption against development
Regional Park	Local authorities	Countryside (Scotland) Act 1967 (as amended by Countryside (Scotland) Act 1981	Scotland
Site of Importance for Nature Conservation	Planning authorities		UK
NATIONAL			
Area of Outstanding Natural Beauty (AONB)	Countryside Commission/CCW	National Parks and Access to the Countryside Act 1949 Nature Conservation and Amenity Lands (Northern Ireland) Order 1985	NI, England, Wales; Designated to conserve natural beauty, but account is taken of the need to safeguard agriculture, forestry and other rural industries, and the economic and social needs of the local communities
Area of Special Protection (AoSP)	Secretary of State	Wildlife and Countryside Act (WCA) 1981	UK; protection of birds; AoSP designation replaces Bird Sanctuary Orders under the 1954 to 1967 Protection of Birds act which was amended by the WCA 1981. Designation makes it unlawful to kill, damage or destroy either the birds for which the area is identified, or their nests
Area of Special Scientific Interest	Environment and Heritage service	Wildlife (Northern Ireland) Order 1985	NI
Environmentally Sensitive Area	Secretary of State	Agriculture Act 1986	UK; maintenance or adoption of particular agricultural methods necessary to conserve or enhance the natural beauty of an area or conserve the flora or fauna or geological or physiographical features of an area

Type of protection	Designating body	Associated statutory instrument	Notes
Historic Garden and Designed Landscape	SNH and Historic Scotland	Non-statutory but recognised in the statutory planning system – Town and Country Planning (General Development Procedure (Scotland) Order 1992	Scotland; representative sample of the most important historic gardens and landscapes. Assessment categories include scenic value and nature conservation value
Marine Nature Reserve	Country agencies	Wildlife and Countryside Act 1981	UK; conserve marine flora and fauna and geological or physiographical features of special interest, while providing opportunities for study of the marine system.
National Nature Reserve	Country agencies	National Parks and Access to the Countryside Act 1949 Wildlife and Countryside Act 1981 Nature Conservation and Amenity Lands (Northern Ireland) Order 1985	UK; always at least part SSSI; contain examples of some of the most important natural and semi-natural ecosystems in Great Britain. They are managed to conserve their habitats, providing special opportunities for scientific study of the habitats, communities and species represented within them. Wherever possible, access by the public is encouraged
National Park	Country agencies First Minister	National Parks and Access to the Countryside Act 1949 Wildlife and Countryside Act 1981 National Parks (Scotland) Act 2000	England, Wales: Designated to preserve and enhance the most beautiful, dramatic and spectacular expanses of countryside, while promoting public enjoyment of them, and having regard for the social and economic well-being of those living within them Scotland: Designated to conserve and enhance the natural and cultural heritage; promote the sustainable use of natural resources; promote understanding and enjoyment of the special qualities by the public; promote sustainable social and economic development of communities
National Scenic Area	Secretary of State	Town and Country Planning (Scotland) Act 1967 Housing and Planning Act 1986	Scotland; designated to conserve areas of national scenic significance
Natural Heritage Area	Secretary of State	Natural Heritage (Scotland) Act 1991	Scotland; may be designated where special protection measures are appropriate for an area of outstanding value to the natural heritage. None designated

Type of protection	Designating body	Associated statutory instrument	Notes
Sites of Special Scientific Interest (SSSI)	Country agencies	National Parks and Access to the Countryside Act 1949 Wildlife and Countryside Act 1981	UK; Notification required where country agency is of the opinion that an area of land is of special interest by reason of any of its flora, fauna or geological or physiographical features
		Countryside and Rights of Way Act, 2000	UK. New right of access to open countryside. Improves the law on rights of way and the management of SSSIs and AONB and strengthens the enforcement of wildlife law.
		Environmental Protection Act 1990	UK. Created EN, the Nature Conservancy Council for Scotland (now SNH), the CCW, and the Joint Nature Conservation Committee
		Natural Heritage (Scotland) Act 1991	Created SNH
EUROPE			
Special Area of Conservation (SAC)	Secretary of State	EC Habitats and Species Directive 1992 Conservation (Natural Habitats etc) Regulations 1994	UK (EU); nearly always SSSI; SACs to protect habitats and (non-bird) species to complement SPAs in a suite of sites known as Natura 2000 sites
Special Protection Area (SPA)	Secretary of State	EC Directive on the conservation of Wild Birds 1979 EC Habitats and Species Directive 1992 Conservation (Natural Habitats etc) Regulations 1994	UK (EU); nearly always SSSI; established SPAs for birds and emphasised the need for wider countryside measures to protect habitats and species
Biogenetic Reserve	Council of Europe	Council of Europe Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1979	UK; always SSSI; aims to conserve wild flora and fauna and their natural habitats and to promote cooperation between countries in their conservation efforts
Diploma Site	Council of Europe	Article 15a of the Statute of the Council of Europe	UK (EU)
	Council of Europe	Bonn Convention on Migratory Species of Wild Animals 1979	UK (EU); Recognised the need for countries to cooperate to conserve animals that migrate across national boundaries/ between areas of national jurisdiction and the high seas
		Agreement on the Conservation of Bats in Europe 1991	Signatory states undertake to implement an Action Plan for species and habitat conservation and species management for bats

Type of protection	Designating body	Associated statutory instrument	Notes
	Council of Europe	Water Framework Directive 2000	Management plans for each European river basin, compelling member states to ensure waters are up to a reasonable standard by 2015
Emerald Network of Areas of Special Conservation Interest	Soft law – obligations can only be requested	Created in 1989 by recommendation 16 of the Standing Committee of the Bern Convention 1979; adopted by resolution 3 in 1996	Contracting parties to the convention; protection of habitats and species
GLOBAL			
Ramsar site	Secretary of State	Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971	UK; always SSSI
World Heritage Site	UNESCO	UNESCO Convention concerning the protection of the World's cultural and natural heritage (World Heritage Convention) 1972	UK; always SSSI
Biosphere Reserves	Secretary of State	UNESCO's Man & the Biosphere (MAB) ecological programme (project number 8) 1970	UK
		Rio Convention on Biological Diversity 1991	Production of national Biodiversity Action Plans
		ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas) 1993 – an international agreement between countries bordering the North and Baltic Seas	Promotes the conservation of small cetaceans. Participating States agree to cooperate on issues including national legislation and research into, for example, cetacean population sizes and the effects of fishing
		African Eurasian Waterbird agreement (AEWA) 1995	Signatory states undertake to implement an action plan for species and habitat conservation, and species management for specified groups of water birds

Annex II – Press Release

In June the Society issued a press release announcing the study on SSSIs and seeking input from interested parties. The press release is copied below

Embargoed Until: 00.01 5 June 2000

Royal Society investigates future of nature conservation areas

The Royal Society¹ is undertaking an independent study to examine the future of Britain's Sites of Special Scientific Interest (SSSIs)² and identify how they can be maintained and expanded to cover as yet unprotected areas, it was announced today (5 June), World Environment Day.

A working group of nine experts³ has been established under the chairmanship of Professor John Pickett FRS, whose final report will review the scientific basis of the SSSI system and put this into the context of the drive towards attempting to conserve our natural heritage.

Due to report by the autumn of 2000, the working group will principally examine the scientific issues, but also draw upon the large body of information already gathered by the many agencies concerned. This will take into account pressures on species diversity, both by direct human activity and by climate change, and link with wider conservation issues.

The working group will seek to:

- Examine the impact of current and pending legislation on the preservation of existing SSSIs
- Investigate the scientific basis for a wider role in maintaining whole ecosystems rather than concentrating on individual endangered species or land form preservation
- Investigate the impact of land use changes on SSSIs and identify routes by which to obviate related SSSI losses
- Consider the flexibility of the SSSI system in relation to outside influences such as climate change etc
- Review the conservation of marine ecosystems and provide recommendations for future marine conservation

The working group will utilise the expertise of additional contributors to deal with specific aspects of the report and will consult directly all those agencies that have contributed to the establishment and maintenance of the SSSIs. The report will make recommendations resulting from both the scientific and the consultative activities of the working group.

2/ROYAL SOCIETY INVESTIGATES FUTURE OF NATURE CONSERVATION AREAS

Further information can be submitted by interested parties to Miss Ruth Cooper, The Royal Society, London SW1Y 5AG., email: ruth.cooper@royalsoc.ac.uk, Tel: 020 7451 2587

NOTES TO EDITORS

1 The Royal Society is an independent academy promoting the natural and applied sciences. Founded in 1660, the Society has three roles, as the UK academy of science, as a learned Society,

and as a funding agency. It responds to individual demand with selection by merit, not by field. The Society's objectives are to:

- recognise excellence in science
- support leading-edge scientific research and its applications
- stimulate international interaction
- further the role of science, engineering and technology in society
- promote education and the public's understanding of science
- provide independent authoritative advice on matters relating to science, engineering and technology
- encourage research into the history of science

2 SSSI is the term used to denote an area of land as being of special nature conservation interest in Great Britain. They form a nationally important series which contributes to the conservation of our natural heritage of wildlife habitats, geological features and landforms

Further information can be found on the following web sites:
English Nature: <http://www.english-nature.org.uk/start.htm>
DETR consultation: <http://www.wildlife-countryside.detr.gov.uk/consult/sssi/index.htm>

3 The working group's members are: Professor John Pickett, IACR Rothamsted, Herts; Dr Tim Barraclough, Department of Biology, Imperial College London; Dr Stephen Covey-Crump, Department of Earth Sciences, University of Manchester; Professor Peter Crane FRS, The Royal Botanic Gardens, Kew; Dr Rita Gardner, Executive Director, Royal Geographic Society; Dr Mark Hill, Institute of Terrestrial Ecology Monks Wood; Dr Anson Mackay, Environmental Change Research Centre, University College London; Dr Martin Price, Director, Centre for Mountain Studies, Perth College, University of the Highlands and Islands; Professor John Shepherd FRS, Earth System Modelling Initiative, School of Ocean & Earth Science, Southampton Oceanography Centre, University of Southampton.

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