

**Guidelines for selection of
biological SSSIs**

Rationale

Operational approach and criteria

Detailed guidelines for habitats and species groups

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Revision of *Guidelines for selection of biological SSSIs*

The guidance reproduced here is essentially a copy of the *Guidelines for selection of biological SSSIs*, published by the Nature Conservancy Council in 1989 as a soft-back book. This was reissued in 1992, 1995 and 1996 as a ring-bound, loose-leaf edition. However, since 1989 four chapters have been updated and one new chapter has been written. These have been published as follows:

Revised Chapter 12	Non-vascular plants	Published February 1992 both as a separate bound booklet and as loose-leaf inserts to the ring-bound edition
Revised Chapter 8	Bogs	Published December 1994 both as a separate bound booklet and as loose-leaf inserts to the ring-bound edition
New, unnumbered chapter	Intertidal marine habitats and saline lagoons	Published February 1996 both as a separate bound booklet and as loose-leaf inserts to the ring-bound edition
Revised Chapter 6	Freshwater habitats	Published December 1997 as a replacement page for the softback edition
Revised Chapter 16	Freshwater and estuarine fish	Published December 1997 as a replacement page for the softback edition

This new edition contains the revisions to Chapters 6 and 16 and revisions to the Contents list but is otherwise unchanged from the 1989 original. It should therefore be used in conjunction with the separately-published revised Chapters 8 and 12 and the new, separately-published unnumbered chapter.

The revised chapters and new chapter apply only where the whole of the SSSI notification procedure follows the publication of the revision or new chapter. Revised or new chapters do not apply where the notification procedure for a site had already started at the time of their publication.

Further revised or new chapters of the *Guidelines* may be published in the future. For further information, contact the Publications Officer, Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough PE1 1JY.

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FOREWORD

The Nature Conservancy Council (NCC) has a duty under the Wildlife and Countryside Act 1981 to notify any area of land which in its opinion is "of special interest by reason of any of its flora, fauna, or geological or physiographical features". Such areas are known as Sites of Special Scientific Interest (SSSIs). The notification is made to owners and occupiers, the local planning authority and the Secretary of State. SSSIs were previously notified to local planning authorities under the National Parks and Access to the Countryside Act 1949, essentially as a means of ensuring consultation over planning applications. Under the 1981 Act, owners and occupiers have the right to make objections and representations (in the case of land not previously notified), and the notification imposes obligations on them to give notice to the NCC of proposals to carry out potentially damaging operations. The decision on whether land is notified as an SSSI rests with the Council, whose members are appointed by the Secretary of State and who represent a range of interests including those of farmers and landowners.

In view of the increased significance of SSSI notification, we are making more information available about the factors which guide the NCC in determining "special interest". In 1982 we published an explanatory leaflet entitled The selection of Sites of Special Scientific Interest. General information about SSSIs, their notification and management agreements is contained in the NCC's booklet entitled SSSIs - what you should know about Sites of Special Scientific Interest, a revised version of which was published in April 1988. The present document sets out more fully the general principles upon which the NCC bases its determination of "special interest" in regard to biological SSSIs. These are supplemented by guidelines for particular wildlife habitat types (formations) and species-groups which are used by NCC officers in assessing information about sites, organising survey and validation in the field and preparing cases for SSSI notification. We propose also to publish guidelines on the selection of geological and physiographical SSSIs in the context of our forthcoming Geological Conservation Review.

In deciding what is "special", we seek to identify the most important areas for the range of habitats and diversity of wildlife occurring naturally in Britain. The wider environment outside SSSIs also contains a great deal of wildlife interest, though in some areas much of it has been lost through intensive agriculture, coniferous afforestation and building. The more that the wider environment becomes impoverished in its wildlife, the sharper is the distinction between what is "special" and what is not. And the more that natural and semi-natural habitats decline through human impact, the more important do the remaining areas become. Thus we keep the total number and extent of SSSIs under constant review, and our judgement is assisted by our growing knowledge of the status and distribution of habitats, with their associated animals and plants.

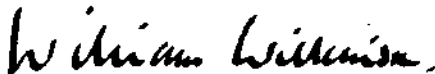
The NCC's judgement is applied not only to the identification of new SSSIs but also to the deletion of those areas which, through damage or natural causes or because of more rigorous judgement, can no longer be considered "of special interest".

The NCC's approach to the conservation of SSSIs is based on co-operation with owners and occupiers in the appropriate management of the land to maintain its special interest. It is not our policy to seek to exclude all agriculture and forestry; indeed the continuation of the current land-use is often essential to maintain the habitat for wildlife. For example, the interest of chalk downland depends on grazing, of hay meadows on mowing, and of much ancient woodland on coppicing. However, some forms of agriculture and afforestation are incompatible with the conservation of SSSIs. In these cases the NCC is normally prepared to offer landowners and occupiers compensation, calculated on the basis of profit forgone, through a management

agreement if they give up their proposals; where an agricultural grant application is refused because of our objection, this is a statutory obligation. The NCC also offers management agreements and grants for positive management of SSSIs, and these can encourage local employment. Within the SSSI network we have established a series of National Nature Reserves. The NCC owns or leases some of these and manages others under an agreement, employing wardens and estate workers to look after them and facilitating public access. In these ways we seek to carry out our duty to have due regard to the needs of agriculture and forestry and to the social and economic interests of rural areas.

Development authorised by planning permission under the Planning Acts is excluded from the provisions for SSSIs in the Wildlife and Countryside Act. However, local planning authorities must consult the NCC before granting a consent on an SSSI. We advise them and, where appropriate, the Secretary of State before a final decision is made.

We think it important to publish this explanation of the current guidelines for the selection of biological SSSIs because nature conservation relies for its success on public understanding and support.



Sir William Wilkinson
Chairman
Nature Conservancy Council
March 1989

PART A RATIONALE

1 The purpose of the guidelines

- 1.1 These guidelines are intended to provide a consistent rationale for the evaluation and selection of biological Sites of Special Scientific Interest (SSSIs) throughout Great Britain, in accordance with the NCC's statutory duty under section 28 of the Wildlife and Countryside Act 1981 to notify any area of land which in its opinion is of special interest by reason of any of its flora or fauna. They aim especially to help NCC staff in the selection of SSSIs for recommendation to the Council, but they are also intended as a public statement of the selection process for all interested parties. The rationale and criteria for selection of geological and physiographical sites will be provided separately.
- 1.2 This first part sets out general principles from which the evaluation and selection procedure has developed and discusses background issues and concepts about which questions are often asked. Part B deals with the broad operational approach and criteria for SSSI evaluation and selection as a whole, as the first level of guidance. Part C presents more detailed and specific guidelines for NCC staff for each main habitat formation and species-group.
- 1.3 The original guidelines for SSSI selection used within the NCC were developed between 1975 and 1979 by its Chief Advisory Officer, Dr N W Moore, with the help of colleagues in a group which he chaired. The basic rationale of their approach has been retained, but their guidelines have subsequently been elaborated by the NCC's Chief Scientist Directorate (CSD), with wide consultation both within and outside the NCC. This revision has been stimulated especially by the recent availability of much of the National Vegetation Classification (NVC) commissioned by the NCC from the University of Lancaster, which has given a new and more systematic basis for selection according to vegetation-based habitat types. This will be published for the NCC by Cambridge University Press as British plant communities (Rodwell in prep.).

2 The objective of the SSSI system within an overall nature conservation strategy

- 2.1 Nature conservation in Great Britain (NCGB) (Nature Conservancy Council 1984) stated (paragraph 15.1): "The primary objective of nature conservation is to ensure that the national heritage of wild flora and fauna and geological and physiographic features remains as large and diverse as possible, so that society may use and appreciate its value to the fullest extent." Site safeguard, that is the protection and management of the most important areas for wild flora and fauna and their habitat, is regarded as the cornerstone of conservation practice and, within this, SSSI notification is now the principal statutory means of achieving this goal.
- 2.2 In the National Parks and Access to the Countryside Act 1949, the areas of special interest were specifically differentiated from nature reserves as "not being land for the time being managed as a nature reserve". The 1981 Act withdraws this distinction and thus makes it a requirement to notify nature reserves of appropriate quality as SSSIs. The SSSI designation is thus applied to all National Nature Reserves (NNRs) and to all those sites deserving NNR status listed in A Nature Conservation Review (NCR)

(Ratcliffe 1977). It can also be applied to any other category of non-governmental or private reserve of sufficient quality. The majority of SSSIs, however, have no other conservation status and remain in private ownership, but are subject where appropriate to management agreements to safeguard their special interest.

- 2.3 The biological SSSI series is intended to form a national network of areas representing in total those parts of Great Britain in which the features of nature, and especially those of greatest value to wildlife conservation, are most highly concentrated or of highest quality. The further intention is that the interest of this site network will be safeguarded under the provisions of sections 28 and 29 of the Wildlife and Countryside Act 1981. Each site represents a significant fragment of the much-depleted resource of wild nature now remaining in this country. The much larger area of Britain outside the SSSIs contains a considerably greater proportion of the commoner habitats and species than the special sites; its total wildlife importance is thus very high, but it tends to be more thinly dispersed. Nature conservation is no less essential there than in the SSSIs, but it will have to be fostered by a non-statutory and less direct approach of advice, education and persuasion. Species protection legislation and measures for safeguarding scenic beauty and landscape amenity also complement the conservation both of SSSIs and of the wider environment outside them. The ecological interdependence of the SSSIs and this wider environment is crucial and, while designation necessitates drawing clear boundaries, it is important to integrate as far as possible the conservation measures for both elements in a total approach.
- 2.4 NCGB also stated (paragraph 15.2.4): "Collectively, the national total of protected areas should be large and varied enough to guarantee the survival of a necessary minimum of Britain's wildlife and physical features." It is appropriate that the total area of habitats and the total size of species populations identified as having special interest should correspond to this "necessary minimum" of the national resource of nature. Many nature conservationists believe that the losses of wildlife and habitat in Britain have already gone so far that, in the developed lowlands at least, all remaining natural and semi-natural habitat has special interest. As a general principle, the rarer the habitat or the more threatened the remainder, the higher is the nature conservation value of what is left. And for the larger expanses of undeveloped habitat, in the uplands and on some parts of the coast, it is important that the proportion of the total area selected for SSSI designation is sufficient to represent the complete field of biological interest, in the event that all the rest should change or disappear.
- 2.5 While there is no overall target area, the total extent of SSSI land will reflect the consistent application of these principles, selection procedures and standards countrywide. About 7% of Great Britain is already designated as SSSIs, with geological and physiographical sites contributing to this total. Allowance then has to be made for the known number of impending new SSSI designations, for the discovery of yet others of the requisite quality in areas so far unsurveyed, and for the eventual representation of neglected groups of flora and fauna (mainly lower plants and animals) in the choice of sites. Present indications are that the total area of SSSIs will cover at least 8% of Britain. The extent of SSSI land will continue to vary geographically, according to the wide regional differences in extent of natural and semi-natural habitat within which the choice is made. The present range is from 22% in Orkney to 0.2% in West Yorkshire.

- 2.6 It would be inappropriate and undesirable to prescribe a definite limit to the total number and area of special sites which should be designated as SSSIs. "Special interest" in the features of nature is not fixed in time. It is a combination of the intrinsic attributes of nature and the values that people place upon these; and both of these parameters are prone to change in time. Particular examples of habitats may lose value through deterioration, but the type in general may become more important through its increasing rarity. Some species may become more common and less threatened, whilst others decline and assume increased value. The numbers of people interested in a particular feature of nature may also increase or decrease, or their interests show a shift in perspective, so that the kind and weight of public interest are also subject to change. The rest of this introduction will examine the underlying basis of the rationale for the identification of SSSIs.

3 The concept of special scientific interest

The concept of this category of protected area first appears in the report to Parliament of the Wild Life Conservation Special Committee (England and Wales), Conservation of nature in England and Wales (Cmd. 7122, 1947), but as "Sites of **Special Scientific Importance**". In the 1949 legislation, the word "importance" was replaced by "interest", but the two are regarded by the NCC as synonymous.

- 3.1 The 1949 and 1981 Acts speak only of "any area of land . . . of special interest by reason of [any of] its flora, fauna, or geological or physiographical features", although the word "scientific" appears in the marginal notes. Yet, while the term "Site of Special Scientific Interest" is a Nature Conservancy invention with, technically, no legal status, it has become a widely understood and accepted term covering the legal formulation. The NCC is required only to exercise its "opinion" in the selection of sites for notification, and the use of this word is a wise recognition that special (scientific) interest is a matter of informed best judgements rather than rigid application of objective rules. No further guidance has ever been given in the legislation on how such opinion should be reached or on the interpretation of either "area" or "special interest". It has, accordingly, remained for the NCC to decide the conceptual framework and criteria for the determination of special (scientific) interest and the choice of areas. The NCC has long understood biological interest to mean the wildlife value of an area to society for a broadly conceived range of cultural purposes which include science, but also educational, recreational, aesthetic and inspirational values (NCGB, 1984). "Nature conservation interest" would nowadays be a more appropriate term than "scientific interest", covering both biological and physical features, but it was decided to retain the designation "SSSI" to avoid confusion. Given that nature conservation interest varies greatly from place to place, **special** interest must refer to the upper part of the quality range of such variation found over Britain as a whole. The delimitation of this upper segment depends on the collective view of those with particular knowledge of the features of nature - biologists and natural historians of all kinds, both inside and outside the NCC.
- 3.2 The determination of special interest requires first the descriptive recording of the biological attributes and controlling physical environmental features of an area and then the application to these of agreed criteria of nature conservation value. The descriptive part of this process can, within the limitations of available resources and expertise for field survey, be made reasonably objective or, at least, standardised. The

evaluation part involves integrating and balancing the views not only of widely differing interests in the phenomena of nature but also of many different individuals within each interest. At first sight, the interests of, say, a geneticist and a wildlife photographer might seem to be widely different (though it is possible that some people are both); yet both will be concerned about the probability that any protected area will contain material in which they happen to be especially interested. Since such probability is closely related to the biological variety located within the area, it follows that greater variety within a site will tend to be highly valued from both viewpoints. The criteria which satisfy different kinds of interest in wildlife tend, in fact, to show much common ground.

3.3 The complexity in evaluation lies not only in differences in values and needs between separate interests, but also in the diversity of viewpoints within any one interest. And in nature itself there is such enormous variety to be considered - a vast array of habitats, communities and species which may need assessing in different ways by virtue of the widely varying environmental patterns which control their existence. Nor do nature conservation values necessarily remain static: as certain features become ever rarer through human impacts, so the value of the remaining examples increases. And, as more people become interested in a particular aspect of nature, so their view increasingly weights the collective interest. The values that people place upon nature are fundamentally subjective and we can only try to synthesise them into a corporate view. The second part of the determination process must therefore inevitably remain a matter of best judgements. It is, nevertheless, important to rationalise and systematise the evaluation and selection of SSSIs and to impose as much rigour and consistency as possible on the whole process. Because nature conservation values are dynamic and still evolving, periodic review of this process is necessary, to ensure that it continues to meet the needs of society.

3.4 Very little of Britain's surface is unmodified by human influence, and **natural** habitats, in this sense, are confined to high mountain tops in the Highlands, cliffs, limestone pavements, some peat bogs, some mountain lakes and rivers (and their islands) and certain coastal features. The pervasive effects of atmospheric pollution have, moreover, caused chemical modification of many habitats unaltered by direct human intervention. There is, however, a good deal of habitat, possibly 30% in total, which is **semi-natural**, that is modified by human activity from its original state but with a vegetation composed of native species, similar in structure to natural types and with native animal communities. This semi-natural habitat consists in the lowlands of fragmented ancient broadleaved woodland, acidic heath, calcareous grassland and scrub, peat bog and fen, lake and river, salting and grazing marsh, and stable dune and machair; but the bulk of it is upland grassland, heath and blanket bog. Most semi-natural habitat is subject to low-intensity use, as unimproved grazing land or for field sports, and some is virtually unused. Its total contribution to national wealth, measured in conventional terms as Gross Domestic Product, is miniscule, and very little is developable without injection of public subsidy; yet its value to the nation as a scientific, educational, aesthetic and recreational resource is very high. The remaining 70% of our land is intensively used, mainly for agriculture and commercial forestry and for urban, industrial and transport purposes. Its habitats are for the most part artificial, both structurally and in the prevalence of introduced or domesticated species. The extent and quality of semi-natural habitat continue to decline, as further development by other land-use interests

proceeds, so that the application of adequate conservation safeguards to the best of what remains assumes increased importance and urgency.

- 3.5 While the modified and developed land covering most of Britain has a considerable wildlife content in total (see 2.3 above), most of this interest is thinly dispersed or fragmented into a vast number of small bits of habitat which do not lend themselves to a site-based conservation approach. Conservation by the protection of special sites is appropriate to places where the wildlife interest is especially high or concentrated. In practice, this means that SSSIs are identified largely within the areas of natural and semi-natural habitat, that is the undeveloped 30% of Britain, though at present they amount to only about one quarter of it. There is, however, a considerable geographical unevenness in distribution of natural and semi-natural habitats, from perhaps 5-15% in many lowland English counties to 50-95% in upland districts of Wales, northern England and Scotland. The tendency for high wildlife rating to be given mainly to the less modified types of habitat is partly a matter of the intrinsic interest of the communities and species, but is also related to their scarcity, to their vulnerability to damage and loss, and to the difficulty of restoring them in the event of such adverse change. In general, the more that an original habitat has been modified, the greater the difficulty and costs of re-creating its structural and species composition in full. Beyond a certain level of modification, full restoration of most habitats is a virtual impossibility, so that creative conservation is seldom an adequate substitute for the loss of original examples.
- 3.6 There is some confusion over the reasons for placing a high nature conservation value on certain habitats which are often described as "man-made", notably grasslands (both lowland and upland) and heather moorland. This comes about when the distinction between these and "natural" habitats is made in black-and-white terms, instead of their being seen as a continuum of variation. The logic of this approach is that there is really no difference in wildlife value between an ancient hay meadow and a weed-free field of wheat or rye-grass, or between an ancient Highland pinewood and a recent plantation of Sitka spruce. This is patently untrue. The semi-natural habitats are dominated by native species and they usually retain an overall species-richness or structural diversity which contrasts strongly with that of modern farm or forest monoculture crops. In the uplands, semi-natural habitats may be species-poor, but the original natural types were often limited in species variety too, and this is not a valid reason for regarding them as worthless in nature conservation terms and converting them to artificial habitats, for example by commercial afforestation. Many introduced or feral species have become accepted as wildlife, for example the little owl, muntjac deer, wild goat and sweet chestnut, but introductions deliberately managed as crop plants or domesticated animals do not qualify. Reintroductions such as the capercaillie and sea-eagle are more readily accepted. Attitudes here are highly subjective and varied, and the NCC takes note of what appears to be the prevailing majority view. The main consideration for acceptance is that a species' occurrence does not convey a sense of large-scale and recent or continuing human intervention.
- 3.7 The end-point of human modification of nature is either the built environment or artificially created communities of plants and animals in the form of household gardens, urban parks and botanical and zoological collections ('gardens'). There has to be a limit to the concept of special (scientific) interest along the continuum of modification of habitat, or

the concept becomes meaningless (see Figure 1). Designation as SSSIs is, accordingly, inappropriate to many sites of highly artificial character, including a majority of those in the urban environment. Some artificial habitats nevertheless qualify, by reason of their complement of native species, and the limits of special interest are again a matter of judgement (see C.10). Urban areas often contain a good deal of wildlife interest, both generally and within particular sites. Many of these sites, especially waste land, offer potential for the development of such interest, and this has high value by virtue of proximity to large numbers of people. There is thus a considerable need for developing appropriate measures for urban nature conservation. Because of their especially high social value, including opportunities for education, the responsibility for conserving urban sites lies more appropriately with local authorities, either by designating Local Nature Reserves or through other arrangements. Urban areas nevertheless contain some sites of undoubted SSSI quality, and these require notification by the NCC, whatever other local arrangements are made for their safeguard.

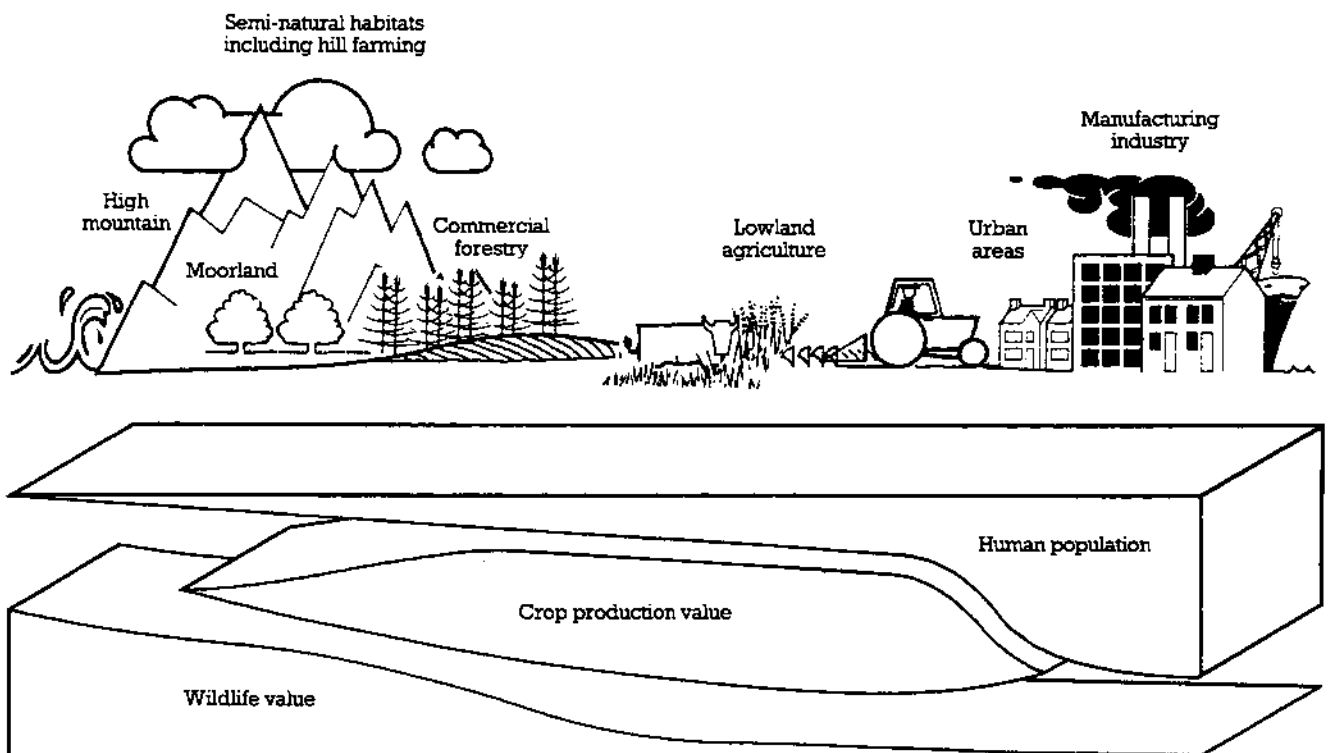


Figure 1 Diagrammatic representation of the continuum of modification of habitat by human influence, showing relative values for wildlife, crop production and human occupation (adapted from Figure 12 of Nature conservation in Great Britain)

4 Rationale for evaluation and selection of a countrywide series of biological SSSIs

- 4.1 It is worth considering how the standards and criteria for the recognition of important sites have come about. They have evolved over the period of about 150 years during which the study of natural history became a leading preoccupation in the scientific, intellectual, aesthetic and recreational life of this country. The growing number of county and regional works on flora and fauna (and their modern additions or replacements), the learned and scientific journals on natural history, biology and ecology, and the unpublished writings and conversation of both amateur and professional biologists have provided an accumulating wealth of information about what have been judged to be important localities and areas for wildlife of various kinds. An inherited knowledge of the best places to go to find and collect rare and local species developed during Victorian times and became part of a common fund of knowledge amongst naturalists. Many of these places are repeatedly referred to in the literature, such as county floras and faunas, and acquired fame over a long period.
- 4.2 When, in 1915, Charles Rothschild compiled a list of desirable nature reserves for the Society for the Promotion of Nature Reserves, he drew on the opinions of many leading figures throughout the country. Thirty-two years later, the listings of the Society's Nature Reserves Investigation Committee were adopted and published, with amendments, by the Wild Life Conservation Special Committee and represented the distillation of collective knowledge from a large body of informed opinion. A similar sifting was applied to the choice of SSSIs when these became a statutory category. Recent additions to these lists have been mainly of important sites newly discovered, whilst deletions have resulted chiefly from deterioration in quality or actual loss rather than from revaluation of intrinsic attributes. One of the surprising aspects, at least to a lay person, is that there is in general a remarkable degree of agreement between a number of different people over the quality of any one site. This stems from a common understanding and acceptance of background precepts and values. Much of the earlier interest was in rare and local species, so that the sites which became famous were those tending to have the best aggregations of uncommon wildlife. Later, with the growth of ecology as a science, sites with what became classic examples of vegetation types, community patterns or succession and other dynamic processes, or of intensively studied animal populations, were those most acclaimed. Others again became important for the field study and demonstration of evolutionary genetics and physiological adaptations. The scientific interest of the important sites lay especially in their value for university research and teaching, and this sometimes included field experimentation and the collection of material. (See paragraph 50 of Cmd. 7122 for a full exposition.)
- 4.3 The standards of nature conservation value thus became established through practice and precedents based on a collective wisdom. It is interesting now to see how little thought was given by the founding fathers of nature conservation to the definition of formal criteria for evaluation and how much tacit reliance was placed on the soundness of judgement and expertise of those concerned. The Wild Life Conservation Special Committee's report contains virtually no reference to criteria for site selection, though it does make a distinction between the need for ecosystem reserves and for species reserves. Introspection about the way in which high-quality sites were chosen came later, when it became clear that the increased resource implications and competition with other

interests would predictably lead to an increasing questioning of the process. A Nature Conservation Review made a determined attempt to grasp the problem, by a retrospective analysis of the thought processes which had discernibly gone into choice of important sites previously. This was presented as a qualitative rationale based on all the major factors which were consistently detectable as values implicit in the Cmd. 7122 sites themselves. The difficulties of quantifying the procedure, within a scheme using multiple criteria, were discussed, and the danger of giving a spurious objectivity through a numerical scoring system for evaluation was stressed.

- 4.4 The most difficult issue is the framework of judgements against which evaluation takes place. The evaluation of site quality presumes a certain accuracy and consistency in the descriptive stage, but depends especially on the prior definition of qualifying requirements, which will vary according to the type of site. This process leads to decisions on which and how many of the surveyed sites shall be selected for notification under the 1981 Act. Selection is thus the crucial step which determines resource and political implications, and this is the stage which is especially in further need of guiding principles derived from basic conservation objectives. The Wild Life Conservation Special Committee's report gave an authoritative analysis of the purposes of safeguarding the most important biological sites for nature conservation as a series of National Nature Reserves. Within this rationale was enunciated a basic principle for site selection - that the series of sites as a whole should contain adequate representation, in the form of the best examples, of the total countrywide range of variation in natural and semi-natural ecosystem types, with their associated assemblages of plants and animals, considered both as communities and as species. By 1970, a second principle was increasingly becoming used to select certain types of site, namely the identification of a critical standard of nature conservation importance above which all examples qualify for key site status. In selecting key sites of national biological importance, A Nature Conservation Review applied the exemplary site principle to assessment of most habitats, but used critical population size or percentage in the case of wildfowl and colonial breeding bird assemblages. For many important habitats the two best examples were chosen, and for some rare and fragmented habitats (e.g. the Breckland and Lizard heaths) all remaining areas were chosen.
- 4.5 In 1975 the NCC set up a working group of staff, chaired by its Chief Advisory Officer, Dr N W Moore, to draw up formal guidelines aimed at establishing consistent criteria and standards throughout Great Britain for the selection of biological SSSIs. A prime objective was to enable the NCC to identify sufficient habitats to support viable populations of most wildlife species present in Britain, at a time when the vast scale of damage to wildlife habitats, particularly through intensive agricultural and forestry operations, was beginning to be properly appreciated. The criteria developed by this group were based on those used in A Nature Conservation Review for habitats (principally naturalness, diversity, typicalness and size: see B, 2.1-2.5), supplemented by provisions for rare species and important assemblages of animals such as seabird colonies. The group also developed the concept of 'Areas of Search' (see 4.11 below), to ensure that for each habitat type there was both an adequate total area and a good geographical spread. It suggested 2,500 square kilometres as the desirable area for each of these but recognised that for practical purposes it would usually be best to continue to use administrative counties or districts. The guidelines aimed to relate the number of sites selected to the scarcity and

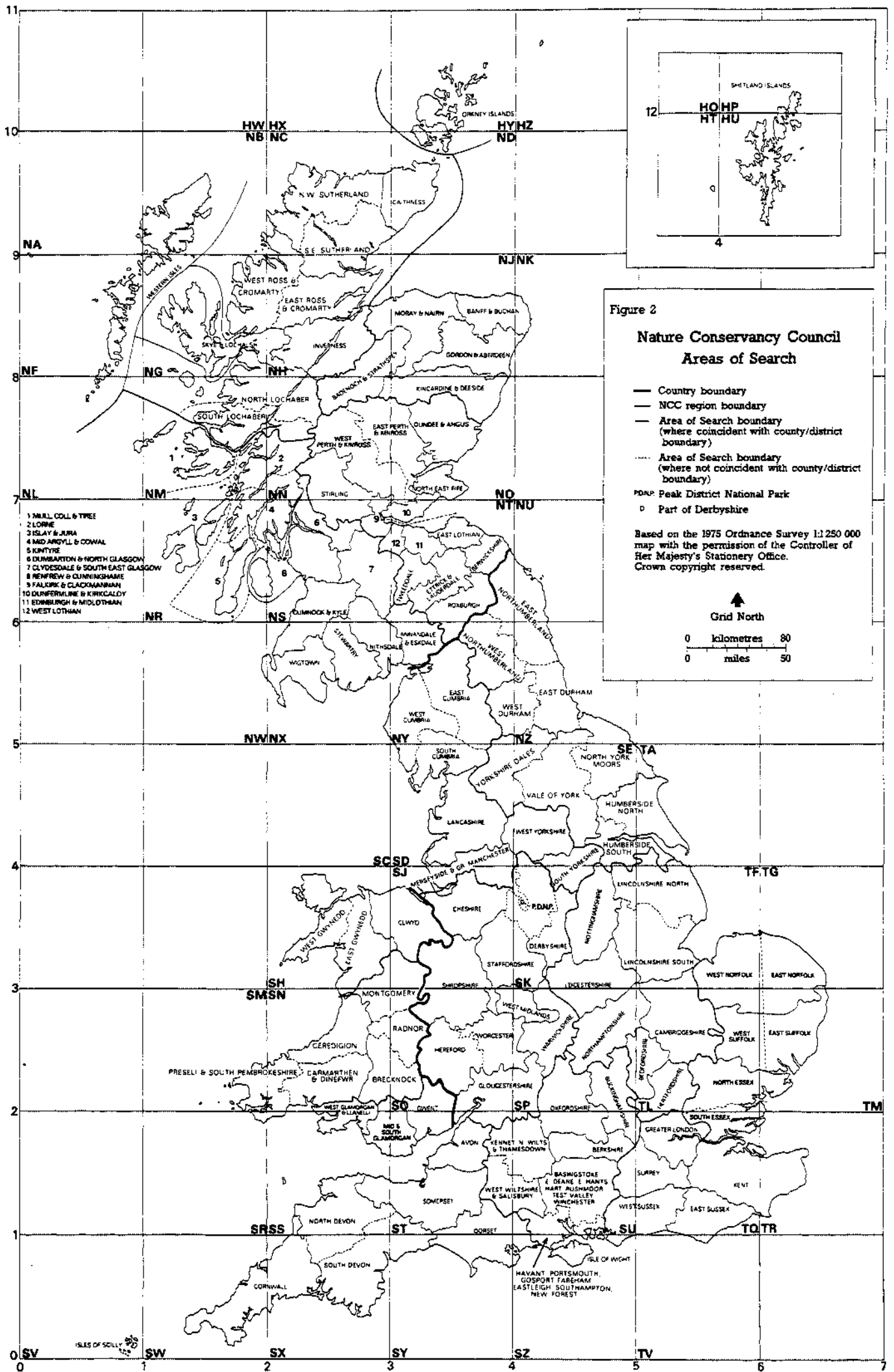
vulnerability of the wildlife resources occurring in them and to integrate SSSI selection and notification with the two other existing mechanisms for nature conservation, the establishment of National Nature Reserves and the promotion of appropriate land-use policies and management practices in the countryside as a whole. This review proved timely in the light of the substantially greater protection afforded to SSSIs by the passing of the Wildlife and Countryside Act 1981. The guidelines were tested for practicability in three counties, Kent, Bedfordshire and Argyll. Studies were also made of the criteria for selecting 'buffer land' for wetland and other SSSIs that required it (see B, 5.4). In 1979 the Council accepted the group's proposals, which form the basis of the guidelines now being published.

- 4.6 Both the principle of representation of best examples and that of critical standards have been applied to the selection of the SSSI series, but the emphasis on one or the other varies according to practical circumstances. For many habitats and species, a large part of the remaining areas and populations can be deemed to have special interest, but there will be geographical variation in such value according to the size of the residual resource. In the county of Cambridgeshire, for example, only a small proportion of the land is now semi-natural, and much of this is in SSSIs. In the still extensive semi-natural habitats of the uplands and coastal areas, a much larger total extent of land, representing the most important segment for wildlife, qualifies for selection. The SSSI series will thus show a gradient. In the highly developed lowlands, there will be a larger number of mostly small and much fragmented sites, compared with a smaller number of large sites within the more continuous expanses of the less developed uplands and coastlands. While it is important to apply minimum standards of quality to the selection of all SSSIs, the principle of choosing nothing but the best examples is now appropriate only to the abundant, extensive and continuous types of ecosystem, notably rivers, northern lakes, cliff coasts and uplands. For many habitats, several of the best examples per region are desirable: this amounts to a modification of the first principle in the direction of the second. In the most highly developed lowland districts there is, indeed, a strong case for regarding almost any area of semi-natural habitat above a certain size as qualifying for SSSI status. Habitats will thus tend to be represented in proportion to the remaining extent of each main type, and there will be variations between habitats and districts in the number and area of SSSIs. Proportionally larger areas of habitats with international importance also need to be selected (e.g. estuaries, heathlands and blanket bogs).
- 4.7 Both the definition of standards and the identification of best examples depend on an evaluation system in which criteria of nature conservation importance are applied to the descriptive survey information (see 3.2). Each criterion is some attribute of nature which is valued in a 'bigger the better' fashion, so that value increases with increase in, for example, size, diversity or naturalness. These values derive from the range of human interests in the actual features of nature themselves, but in some cases are related to the probability of their survival or the difficulties of re-creation if they are lost. The enormous growth of the nature conservation movement since 1947 has caused the balance of human interest to move markedly away from specialised scientific concerns and towards the simple observation and enjoyment of wildlife. This has altered not so much the criteria of 'value' as the 'resource demand' for nature. Popular concern tends to emphasise the larger and more attractive plants and animals rather than the lowlier organisms which may be of equal interest to

science, but its more important influence has been to oppose the further depletion of the wildlife resources of this country and to require that adequate reservoirs be protected within each county or district. Criteria accommodating both scientific and popular interest are used to assess the specific features of similar sites in a comparative way, in order to provide a sift, but the whole procedure depends on the definition of a background classification of the countrywide variety found in nature, to provide a framework of reference. The criteria used are those defined in Volume 1 of A Nature Conservation Review, and they are listed and discussed again in more detail in Part B. Wildlife conservation evaluation (Usher 1986) examines the subject from various perspectives and includes chapters on the NCC's application of evaluation criteria in Britain.

- 4.8 During the last ten years, nature conservation evaluation has developed a world literature, and increasingly sophisticated methods are presented (see Usher 1986). Scoring systems nevertheless have inherent pitfalls and should be used with great caution. Although often described by their proponents as "objective" systems, they are invariably too loaded with hidden value judgements and subjective assumptions for this to be a valid term: the strength of a chain is that of its weakest link. Scoring procedures are useful in providing a consistent and repeatable method for ranking sites of similar type in order of importance. Their further application to decision-making in the selection of sites as SSSIs has a validity which is limited by the arbitrariness of the scoring method and the choice of threshold scores or other underlying instructions. Not the least problem is that the still considerable unevenness in survey knowledge of natural and semi-natural habitats in Britain causes an immediate bias when scoring of attributes is applied as a basis for comparisons. Some of the described methods refer only to particular habitats or limited areas, and the difficulty of maintaining a uniform and numerical approach increases greatly when all the biological attributes over a whole country have to be considered. Only limited use of scoring methods has so far been used by the NCC, and much more development will be needed before they can be regarded as appropriate for site selection generally. There appears to be encouraging acceptance of the main NCR criteria as having wide validity and relevance in other countries, and differences of view mostly relate to the precise manner of their application. Some differences in approach are also required between little surveyed countries with a large extent of natural ecosystems and those which are well-known but largely modified by man (e.g. Britain).
- 4.9 The biological attributes which are assessed for selection can be divided into ecosystem or community types and individual species of plants or animals. The ecosystem or community types are based mainly on vegetation categories, but with a variable combination of abiotic features (especially soil conditions) and sometimes associated animal communities. They have become conveniently designated as **habitats**, and this term will be retained here. Habitats are valued in their own right, as communities, and not simply as the ecological niches for species. The primary division into ten major habitat **formations** (C.1-10) is based on that recognised in A Nature Conservation Review. These are subdivided according to the plant communities and sub-communities recognised in the National Vegetation Classification (Rodwell in prep.) and listed in the tables annexed to the chapters of Part C. This is a more comprehensive and precise classification of habitats than any previously available. Animal communities are treated as species-group assemblages (e.g. a list of bird species), according to the currently accepted taxonomic systems (C.13-19).

- 4.10 The chapters on habitat formations and species-groups in Part C indicate the qualitative kinds of information on which evaluation depends and which should be made quantitative as far as possible. The absolute and relative extent of vegetation/habitat types within a site and their particular condition are important to assessment. The abundance and, preferably, the population size of species, at least for those regarded as especially valuable, are also very relevant. And knowledge of the total extent, abundance and status of both habitats and species over the whole country is necessary background in judging the value of their occurrence on any one site. Much of this background knowledge is at present unquantified and patchy, but surveys and recording schemes are increasingly filling the gaps and allowing us to identify rare and declining habitats and species.
- 4.11 For administrative convenience in the notification of SSSIs to local planning authorities, the NCC has adopted a geographical subdivision of Great Britain, mainly into counties in England but based more on districts in Scotland and Wales (Figure 2). This gives areas which vary between about 400 square km and 4,000 square km, but many of the rural areas are around 2,500 square km. This last area, corresponding roughly in size to an average Watsonian vice-county (Dandy 1969), is an appropriate geographical unit on which to base selection of sites to represent special interest in nature as a national network. The need for such a geographical subdivision applies especially to the selection of the best examples of habitats; for selection according to minimum standards it is far less relevant. Subdivision of Britain into biogeographical areas would give the best basis for site selection, but there is no agreed system in use. The administrative areas are largely unrelated to geological, topographical or land-use patterns of variation or boundaries, but they inevitably correspond to some degree of climatic difference because of the major gradients of temperature from south to north and of oceanicity from east to west across Britain. As a practical solution, generally administrative areas have been adopted as 'Areas of Search' for SSSI selection. In practice, other factors tend to override any theoretical bias in selection produced by the size differences of areas. The details of procedure regarding Areas of Search (AOSs) are given in Parts B and C, but, in essence, they give a practical geographical framework for selection within the national range of variation in both habitats and species assemblages resulting from differences in all environmental factors - climate, topography, geology, soils and land-use history.
- 4.12 Other ecological principles may, to some extent, influence the size, number and spacing of sites within any county or district. For instance, for the more mobile animals it will be important to minimise the effects of ecological isolation of species by giving opportunities of dispersal to adjoining localities or by maintaining strategic reservoirs of species which can enhance their occurrence in the wider countryside outside SSSIs. However, these principles have less relevance to plants, in which it is mainly the lower evolutionary groups that have significant dispersal capacity (by means of tiny spores) beyond areas of unsuitable habitat. And the aim of maintaining viable populations of species needs to be broadened: certainly it is important to ensure the survival of rare and vulnerable species, but for many others the requirement is to conserve much more than the bare minimum necessary to guarantee survival. "Special interest" is not simply a matter of rarity and localisation of the habitats and species occurring in Britain but applies also to the best examples and populations of widespread types. Accessibility for observation and study by interested people all over the country is an important consideration. While areas and



populations should be large enough to avoid genetic problems, such as inbreeding depression, there is often little or no choice in these matters and we have to make the best of what is available. 'Natural' guiding principles are thus of rather limited use in the selection of the SSSI series. Selection has to be based on a realistic perception of the values (i.e. "special interest") which concerned society places on these features of nature rather than on the arcane concepts of theoretical ecology.

- 4.13 One of the purposes of these guidelines is to help to achieve consistency in the selection process, especially in regard to **standards**. Because the SSSI system seeks to include sites which are important according to a biogeographical perspective and constructs a national edifice from these building bricks, it is not possible to specify uniform application of criteria to any formation across the country. Indeed, the process has to allow for geographical trends in extent, distribution and abundance of features which cause a different value to be placed on these according to their location. Species tend to engender a special interest at the limits of their range, not simply because they are often uncommon or threatened there, but also because their ecological requirements may become more demanding and their numbers thus more responsive to environmental change. Study of species at their distribution limits may thus give valuable scientific insight both on actual population change and on the nature of controlling factors or processes, and this has relevance both to monitoring and to management. When, conversely, a habitat becomes especially important through its sheer total extent in some parts of Britain, different issues in evaluation and selection are posed.
- 4.14 The legislation has never set any limits to the size of individual areas regarded as having special interest by reason of their flora or fauna, and this has been for the NCC to decide (see 3.1). While upland sites tend to be large compared with most lowland sites, the NCC has always sought to limit the area of an SSSI to that considered essential to satisfy the interpretation of "special interest" in each case. The largest existing SSSI is the Wash, covering 63,135 ha, mostly of intertidal flats and representing the most outstanding coastal wetland in Britain, with international importance besides. International obligations and undertakings are an important factor in the evaluation of specific sites and the selection of the total number and extent to represent special interest both of habitats and of species groups (see B, 3), and the NCC is mindful of the view of the World Conservation Strategy (IUCN 1980) that the Scottish Highlands are a priority biogeographical province for the designation of protected areas. This region contains areas such as the Cairngorms and the Caithness and Sutherland peatlands (the Flow Country) which are of outstanding national and international importance but which are so large that the term "site" scarcely remains appropriate. The Caithness and Sutherland peatlands already contain some SSSIs, but further survey and international assessment have shown that these fall far short of containing the total extent of special interest (see C.8, 5.10).
- 4.15 It is not possible to provide rigid rules for SSSI selection which require only the measurement of attributes to determine whether sites pass a critical total 'score' of value and thereby absolve those concerned from exercising any personal judgement. It is in the nature of the evaluation process that any such thresholds must themselves be arbitrary and subjective. In so many cases there is, in practice, a mixture of attributes which has to be evaluated, and this requires a balance of judgement stemming from a wide experience of the ecosystems and species in question. Where a scoring

procedure is recommended (in the case of certain species-groups), it must be used with the limitations described under 4.8 borne in mind. And whenever threshold levels of value (such as minimum area or population size) are given, they must also be regarded as for guidance, subject to the judgement of those concerned, and are not to be used as an uncritical yardstick for 'accept/reject' decisions. The crucial point is that the decision to select, or not to select, a site for SSSI notification should be defensible if the judgement is challenged. Such a defence must be based on the rationale contained in this document, but with an explanation of how evaluation decisions were reached in a particular case. If discretion has been exercised in regard to specific guidelines, it must be capable of reasoned explanation.

- 4.16 This document aims to provide an exposition of the SSSI selection process, from which to decide, explain and defend any case to the best of our ability. Yet, in the last analysis, each case rests on matters of **opinion**. It is thus not intended that anyone should try to apply these guidelines as a rule-book. They do not provide final or exact criteria, but indications of presumptions to assist decisions for or against selection. On many issues there has to be a residual element of individual discretion, and it will be for those concerned to develop the maximum rigour possible in exercising their best judgement and to consult as appropriate with other people, so that common standards become built into the process. Within the NCC, the Chief Scientist Directorate is a particular focus for advice and means of achieving consistency throughout Great Britain, but the wide expertise outside the NCC should also be remembered and used as necessary. In many instances, decisions are reached by an incremental process, involving not only the cumulative assessment of different features but also the balance of different views. A favourable decision then supports a recommendation to the Council for SSSI status.