These Guidelines have been subject to revision since their original publication.

The pages covering the revised sections have been inserted into this document.

Lancashire County Heritage Sites Scheme

Biological Heritage Sites Guidelines for Site Selection

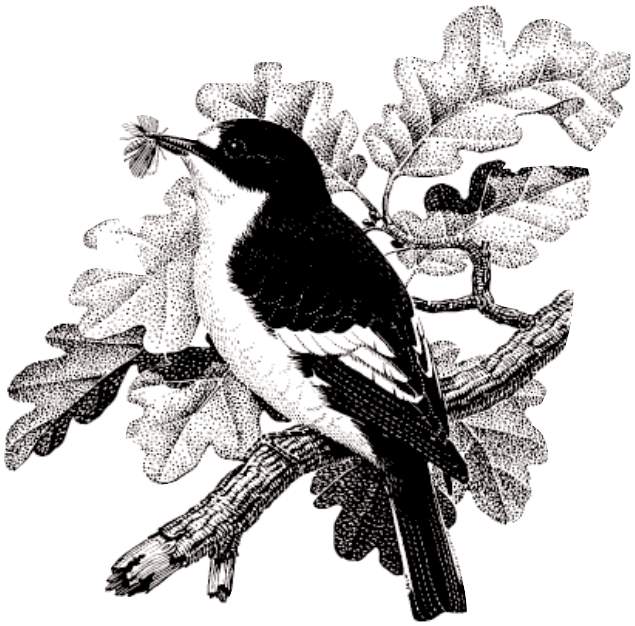
Errata

Page	Guideline	Error
34	Po1	Entries in Table 4. For U and V have been swapped (V appears before U).
43	Ff3	Add: *Stellaria palustris* Marsh Stitchwort
44	Ff3	*Persicaria minor Small* Water-pepper should read: *Persicaria minor* Small Water-pepper
44	Ff3	*Plantanthera bifolia Lesser* Butterfly-orchid should read: *Plantanthera bifolia* Lesser Butterfly-orchid
45	Ff4(a)	*Rhinanthus minor* ssp. *stenophyllusa* Yellow-rattle should read: *Rhinanthus minor* ssp. *stenophyllus* a Yellow-rattle
46	Ff4b	*Polstichum setiferum* should read *Polystichum setiferum*
51	Li6	The species listed under Application should form part of the Guideline. The Application text should read “All sites with six or more of the species listed above recorded since 1987 should be included.“
60	Ma3	Delete the first sentence of the Justification which refers to water vole.
70	Am1a	Guideline should read “...”good” or “exceptional” population...”.
71	Am2	Application reads: “...amphibians not included in (see Guideline Am1a or Am1b), as defined in Table 7.” Should read: “...amphibians (not included in Guideline Am1a or Am1b), as defined in Table 7.”
80	Mo4	*Zenobiella Subrufescens* now *Perforatella subrufescens*
82	In2	Add *Hydroporus longicornis.*

22/1/01

Lancashire County
Heritage Sites Scheme

Biological Heritage Sites



Guidelines for Site Selection

Lancashire Wildlife Trust

Lancashire County Council

ENGLISH NATURE

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top left to bottom right:
P. Jepson 1-6 , S. Craig 7 , P. Jepson 8-9,
G. P. Morries 10 , P. Jepson 11, S. Craig 12,
P. Jepson 13, S. Craig 14, P. Jepson 15-16 and
S. Craig 17.

Foreword

These Guidelines are really two documents in one. Firstly, they provide a systematic basis for the identification of key non-statutory wildlife sites in Lancashire. Secondly, they include an initial audit of habitats and species of nature conservation importance in Lancashire, within the 1974-1998 County boundary.

The Biological Heritage Sites identified using the Guidelines are now an established input into statutory development plans in Lancashire. They are also an important factor of which due account is taken when decisions are made about planning applications. Just as important, they are the basis for increasing proactive conservation by public, private and voluntary sector interests - including landowners and land managers.

Biodiversity is a key part of our environment, and its conservation is a key indicator of sustainable development. Close collaboration between officers of the County Council, English Nature and the Lancashire Wildlife Trust has resulted in this publication - a pioneer in its field. It will provide a sound basis for measuring just how successful we are at conserving biodiversity in the years to come and I commend it to you.

GRAEME BELL

County Planning Officer

Red Grouse

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Thanks are due to the following who have generously assisted in the preparation of these guidelines, or in the provision of biological information on which they are based:

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Lancashire County Council and Lancashire Wildlife Trust would also like to acknowledge the particular contributions of Jon Hickling of English Nature (North West) and Alistair Crowle of the Royal Society for the Protection of Birds and formerly of English Nature (North West). English Nature have also supplied most of the illustrations. We also wish to thank the numerous naturalists and recorders who have freely provided additional biological information on individual sites.

Geoffrey Morries

Peter Jepson

Nik Bruce

Contents

Part A:
Introduction

1. Background

1.1

There are presently some 62 statutory Sites of Special Scientific Interest in Lancashire, designated by English Nature and protected under the provisions of the Wildlife and Countryside Act 1981 (as amended). Sixteen of these sites are designated for their geological importance. The remainder represent the "top-tier" of wildlife sites in the County, being of national or, in some cases, European importance. The latter have either been listed as Ramsar sites and/or classified as Special Protection Areas, or else they are in the process of being considered for Special Protection Area or Special Area of Conservation status. However, the conservation of the County's wildlife heritage also demands a strategy which addresses the needs of wildlife in the wider environment. The identification and conservation of a wider network of important wildlife sites is a major element in such a strategy. The importance of non-statutory sites as well as statutory sites is recognised in the Government's Biodiversity Action Plan (Department of the Environment 1994a) and also in its Planning Policy Guidance on nature conservation (Department of the Environment 1994b).

1.2

The Lancashire Wildlife Trust first compiled a list of non-statutory wildlife sites for Lancashire (known latterly as Sites of Biological Importance or SBIs) over 20 years ago. This list was notified to the local authorities and was updated occasionally. Sites were included on the list because they were highly regarded by local naturalists, their recognition sanctioned by Trust Committee, and from 1985 onwards, all inclusions were ratified by a professional ecologist. Up until 1992, however, there had been no systematic survey or evaluation, and site boundaries had not been determined in many cases. In addition, the uneven coverage of the County as a whole had become particularly apparent in recent years. Other lists of wildlife sites have been compiled on a similar basis for specific types of wildlife site, or for smaller areas of the County. Despite the undoubted value of such lists, and the SBI list in particular, the Lancashire Wildlife Trust, Lancashire County Council, English Nature and other users of these lists have recognised the need to achieve a more objective basis for the inclusion of sites.

1.3

The Landscape and Wildlife Strategy for Lancashire (Lancashire County Council 1990) proposed the identification and conservation of Biological Heritage Sites as part of a County Heritage Site Scheme. This proposal has been adopted and strengthened in the Lancashire Environmental Action Programme (Lancashire County Council 1993). The completion of the Phase 1 Habitat Survey of Lancashire between 1987 and 1992 provided the opportunity to take forward this initiative in a systematic way which addresses some of the deficiencies of the old lists. A working group of officers from Lancashire County Council Planning Department, Lancashire Wildlife Trust and English Nature (North West Region) was accordingly set up to progress the work and produce a definitive and more stable list of non-statutory wildlife sites for the County.

1.4

The *Lancashire Structure Plan 1991-2006 Greening the Red Rose County* contains policies specifically directed at Biological Heritage Sites.

2. The Purpose of the Guidelines

Relation to Sustainable Development

2.1

The aim of the Biological Heritage Sites selection guidelines is to enable the systematic identification of those sites which, together with the statutory wildlife sites, make the most significant contribution to the biological diversity of Lancashire. Collectively, these statutory and non-statutory sites may be referred to as the County's "critical environmental capital" so far as its biological resources are concerned (English Nature 1994a). Any losses of these sites would be regarded as significant beyond the immediate locality, and would be difficult or impossible to make good for all practical purposes (e.g. because of antiquity, complexity, location or special environmental requirements). The survival and conservation of Biological Heritage Sites is therefore a key indicator of sustainable development in Lancashire.

Objectives

2.2

The working group agreed that the network of Biological Heritage Sites should specifically:

a) include representatives of the full range of habitat-types of nature conservation importance in Lancashire;

b) support habitats or species which are threatened or rare nationally, regionally or in Lancashire and/or cannot readily be recreated or re-introduced;

c) reflect the geographical distribution of habitats and species in Lancashire, including notable isolated pockets of the more localised habitats or species.

3. The Nature of the Guidelines

3.1

The general approach to writing the guidelines is based on that adopted by English Nature for the selection of Sites of Special Scientific Interest (Nature Conservancy Council 1989). Much useful background information and guidance on how to interpret and apply guidelines of this type is contained in that publication, to which those interested are referred. However, the guidelines used here apply specifically to Lancashire rather than Great Britain as a whole, and have been kept as simple and as concise as possible. They have been devised by experienced professional ecologists from Lancashire County Council, English Nature and Lancashire Wildlife Trust, assisted by local and national specialists in particular habitat-types and species-groups.

3.2

Sites are eligible for selection if they meet certain minimum standards as set down in the guidelines. The guidelines are divided into two sections: those which deal with the character or quality of the habitat or habitats present, and those that relate to the occurrence of certain species or groups of species.

3.3

It should be noted that all modern approaches to site evaluation for wildlife, including this one, are derived ultimately from a series of basic criteria which were established in the seminal publication *A Nature Conservation Review* (Ratcliffe 1977). The most important of these criteria include size of site, diversity of habitats and/or species, rarity of habitats and/or species, "naturalness", fragility and "typicalness". They form the basis for the specific habitat and species-related minimum standards used here. Thus Biological Heritage Sites are identified primarily on biological criteria, rather than on planning or community-based considerations.

3.4

Explanatory notes appear under each section heading and/or each guideline explaining firstly, how the guidelines are used in practice ("Application") and secondly, a brief non-technical statement of the biological justification for their inclusion ("Justification").

Limitations imposed by information

3.5

The guidelines are based upon the best information which is presently available about the quality and distribution of habitats and species in Lancashire. They reflect the fact that more information is available on some habitats and species than others, and also that ongoing and new field surveys will continue to enhance the biological resource database and hence the facility with which sites can be assessed. For example, few sites have yet been surveyed using the National Vegetation Classification, which, when more widely applied, will form a useful basis for site evaluation. The guidelines are devised to take account of this transitional situation. However, certain habitats and species groups have so far been the subject of little or no systematic survey so that it is difficult or impossible to formulate meaningful guidelines based upon them. This applies, for example, to some aquatic habitats including seasonal wetlands and their environs, and to many groups of invertebrate animals for which more specific guidelines may be appropriate if and when further information becomes available in the future.

Limitations imposed by site type: excluded sites

3.6

Although Lancashire's biological heritage is largely dependent on the existence of semi-natural areas, some artificial habitats are also important. Certain species depend on habitats which are obviously artificial in character. For example, large tracts of intensively cultivated agricultural land can be important for feeding wildfowl. Although such sites are included within the scheme they differ in character from most other Biological Heritage Sites in that they support little or no semi-natural vegetation: they are treated as a separate sub-category. However, certain types of sites and features have generally been excluded. These include buildings, and usually also operational quarries or tips. Whilst such sites can and do sometimes have significant wildlife interest, it is felt that this may best be addressed in other ways.

Landscape Character Tracts

3.7

Lancashire is far from homogeneous in terms of its landscape character or its wildlife resources. For the purposes of certain of the policies in the *Lancashire Structure Plan 1996-2006*, the County has been subdivided into 10 "Landscape Character Tracts". These are characterised in the Structure Plan in terms of their geology, topography, landscape quality and land use, and their wildlife habitats: their locations are shown in Appendix 1 to the guidelines. Since Biological Heritage Sites are intended to reflect the biological diversity of the County as a whole (see below and paragraph 2.1 above), it is appropriate to select these meaningful subdivisions of the County to use as the geographical basis for site selection in certain cases. In this way, the best representative examples of each habitat type can be selected in each area of the County where that habitat occurs (see paragraph 2.2c). In some cases, the Landscape Character Tracts have been grouped into three Landscape Zones; north, south and west.

What is Biodiversity?

3.8

Biological diversity - or biodiversity for short - is the variety of living organisms and systems in terms of habitats, species and local genetic diversity. The term is referred to not only in the basic aim of this project but also in several guidelines, usually in the context of a site making "a significant contribution to biodiversity..." either of Lancashire or of one of its component Landscape Character Tracts or Zones. Such assessments are partly based on professional expertise combined with local experience, but are still guided by the same underlying criteria referred to above. For example, a site which has species or habitats which are rare or decreasing in the County, or a site which supports an isolated population of a more frequent species near the edge of its range, would be rated positively here, and more highly than a site which simply adds to the stock of a common and widespread species or habitat. It should be noted that measures to conserve diversity in the County at the habitat or species level may not automatically be adequate to do so at the genetic level. Extra sites may have to be included in order to gain a reasonable probability of achieving the latter.

Habitat mosaics

3.9

In some parts of Lancashire, a significant proportion of the biodiversity appears to be linked to sites which are not outstanding examples of individual habitat-types. Such sites are best referred to as habitat mosaics. They are often a combination of small relict ancient semi-natural habitats, and land in non-intensive agricultural use; they may also include habitats developed since land formerly in agricultural or industrial use was abandoned or no longer fully

used. The juxtaposition of different habitats within a single site and the transitions between them are themselves valuable ecological features. Thus the value of a habitat mosaic is generally greater than the sum of the values of its component habitats. Such sites are most common on the fringes of urban areas; those areas, in fact, where lowland semi-natural habitats which satisfy other site selection guidelines tend to be comparatively scarce.

Degraded sites

3.10

These guidelines allow the selection of some sites, which although semi-natural in character, are in a much modified and ecologically degraded state. They may be included because they support rare species (see also paragraph 3.11), or because they are the only surviving examples of a particular type of habitat in certain geographical areas. Examples include severely over-grazed moorland, drained lowland mosslands, heavily grazed woodlands or woodlands on ancient sites which have been extensively restocked with planted trees. Such changes can have profound effects on their species composition and vegetation structure. But they remain essentially semi-natural habitats and possess the potential for regeneration or recovery with sympathetic management. Moreover they still represent habitats which cannot generally be recreated in the short-term on alternative sites which do not support these kinds of habitat.

Species Guidelines

3.11

Sites selected on the basis of the habitats they contain will also support a large part of the County's biodiversity in terms of plant and animal species. However, if the Biological Heritage Site network is to support the full range of species which are of conservation importance in Lancashire, sites must also be selected directly on the basis of particular species or species-groups. At the present time, there are no guidelines for the selection of sites on the basis of marine species.

3.12

The species guidelines are, in the main, applied only to species which occur naturally in Lancashire. These include:

a) species known or believed to be native to Lancashire;

b) species which are native to Great Britain and are established colonists in Lancashire without the benefit of deliberate introduction or assistance;

c) introduced species of special biological, historical or cultural interest (very few species are in this category);

d) species which have been re-introduced as part of a recognised strategy for their conservation, e.g. English Nature's species recovery programme.

Species excluded are those which:

e) are known or believed to have been deliberately introduced into Lancashire and to which neither c) nor d) apply.

f) all colonists which are unlikely to persist in the wild without deliberate human intervention.

3.13

It is now widely recognised that the conservation of species should be based on a consistent hierarchical approach which considers species which are of significance at different geographical levels (see Department of the Environment 1994 and Wynne G. *et al.* 1995). Thus the species guidelines for Biological Heritage Sites have been devised to identify sites which support species in categories a) to d) in paragraph 3.12 and which are also in one or more of the following categories:

a) internationally or nationally important species which occur in Lancashire. These species are identified in the relevant EC directives, UK legislation and, in some cases, UK Red Data Books or Lists, as noted under each species guideline.

b) "nationally scarce" species which occur in Lancashire (those which occur in 16-100 10km squares in the UK).

c) species which are rare and potentially at risk of extinction in Lancashire (generally those which are known to occur naturally in 3 or fewer localities in Lancashire).

d) i) species which are at risk of becoming rare in Lancashire (those which are known to occur at more than 3 localities but which could move into category c) because of recent rapid decline, very small population sizes, identifiable threats or the fragility of their habitat);

ii) species which are at the edge of their UK geographical range in Lancashire.

3.14

This standard approach to site selection on species grounds has been used wherever possible in the guidelines. However, wide variations from one species-group to another in terms of the quantity and quality of the data available (e.g. far more data is available for birds or flowering plants than for molluscs or lichens) mean that the way the approach is

applied in practice also varies. Guidelines for some vertebrate groups (e.g. amphibians, birds), whilst influenced by this basic approach, also make use of the results of other detailed studies and established methods on these groups, and consequently appear in a rather different format.

3.15

The approach recognises that Lancashire should play its part in the conservation of species that are important in the wider geographical context, and also those species which, although not necessarily rare in some other places, are rare in Lancashire. This serves not only to protect the biodiversity of the County but also to maintain the natural ranges of species in the United Kingdom.

3.16

In order to help users, individual species guidelines are followed where feasible by a list of species to which that guideline applies in Lancashire. Although it is hoped that these lists may be a useful contribution towards a species audit for the County, they should not be considered definitive since more is known of the distribution of some species-groups than others, and in any case, a species list for any defined area is not static. Records of species new to the County or of species previously considered extinct will also be eligible if they satisfy the terms of the relevant guideline, and the general criteria in paragraph 3.12 (see also Species Guidelines - Application).

4. Application of the Guidelines

4.1

In general, any area of land or water which satisfies one or more of the guidelines is eligible for inclusion in the list. Sites should generally be evaluated on the basis of reliable information obtained (except where otherwise stated) in the field since 1987 (see also p.41). It should be stressed, however, that the guidelines are not rigid criteria for site selection. For example, a site which marginally failed to meet two or more different guidelines could be considered for inclusion. Evaluation of sites is undertaken with special reference to the guidelines but bearing in mind the wider context outlined in Section 3 above.

4.2

It should be noted that the list of sites generated does not include any statutory National Nature Reserves or Sites of Special Scientific Interest, except for geological SSSI's whose biological interest satisfies these guidelines but does not form any part of the basis of the SSSI notification. However, statutory Local Nature Reserves are eligible for inclusion provided that they meet one or more of the guidelines.

Site boundaries

4.3

Site boundaries are drawn as far as possible to be meaningful in biological terms. Where sites are selected on species guidelines, appropriate regard is given to the habitat requirements of the species concerned. Observable physical boundaries or topographic features have been used wherever appropriate. Boundaries do not include "buffer zones". They may however, include areas which marginally fail to meet any of the guidelines but which lie adjacent to others which do. Consideration may also be given to other areas of lesser value, where the latter form an integral part of the management unit (usually a parcel of land) of which the eligible area forms the greater part.

Stages in the process

4.4

Potential sites - both on existing lists, and newly identified from the Phase 1 Habitat Survey, have been evaluated against these guidelines as follows:

Stage 1
Preliminary site selection and site boundary evaluation by contract officers to produce **Initial List** (desk study).

Stage 2
Sites on initial list examined and evaluated by the Biological Heritage Sites Working Group (desk study) and categorised:

a) confirmed

b) rejected

c) subject to further survey/information

Stage 3
Category c) sites above subject to:

a) brief site survey to determine whether site satisfies selection guideline(s), or to confirm/determine site boundary;

and/or

b) obtain additional data from local naturalists, documentary sources, etc.

Data for sites in this stage evaluated by the Biological Heritage Sites Working Group and all qualifying sites from Stages 2 and 3 included in the **Provisional Summary Listings.**

Stage 4
Biological Heritage Sites Working Group agree revisions and listings after wider consultation with interested bodies, and issue **Summary Listings** and **Composite Site Boundary Plans**, subject to future updating.

Stage 5
Site record, including **Site Information Form** and **Site Boundary Plan**, produced for each site on the Summary Listings.

4.5

The Summary Listings contain a few entries where a species-guideline code relating to a particular site is shown in square brackets. This indicates that one or more species covered by that guideline is present on the site, but the evidence available suggests that the population of the species concerned does not fulfil the requirements on distribution pattern or population size as set out in the guideline. This has been done for purely practical reasons to aid users of the computer-based site data record.

4.6

Because of inadequate information on certain sites, the Summary Listings also contain a few "provisional" sites whose proper evaluation will take place as and when adequate survey information becomes available. Other sites definitely qualify for inclusion in the list on the basis of one or more guidelines and, at the same time, qualify provisionally on the basis of other guidelines. All such provisional entries are shown with a question mark on the lists. It is recommended that provisional sites should be treated in the same way as confirmed Biological Heritage Sites so far as development control procedures are concerned, unless and until it can be demonstrated that the sites concerned do not, or are unlikely to, fulfil the terms of the relevant guideline.

Annual Review

4.7

The Summary Listings, Site Information Forms and Site Boundary Plans continue to be subject to review in order to take account of new information, and as sites change or are lost or damaged. Proposals for changes are normally considered at an annual review meeting of the Biological Heritage Sites Review Panel, whose decisions are contained in an annual schedule of site amendments. Despite these changes, the Summary Listings should be much more stable than has been the case with previous lists of non-statutory sites.

Monitoring

4.8

Wildlife sites are vulnerable to change. Consequently, some form of planned monitoring of sites should ideally be undertaken. Comprehensive regular monitoring of the continued existence of the qualifying habitats and species on all BHS has substantial resource implications. In order to ensure that all BHS are re-surveyed and their interest confirmed regularly, it is suggested that the monitoring process should be geared to a full review, or a review of the relevant sections, of a district-wide local plan. This will help to ensure that local plans are based on up-to-date information as required by sections 11 and 30 of the Town and Country Planning Act 1990.

4.9

The BHS monitoring process will involve the following stages:

Stage 1
Re-survey

a) The presence of the qualifying habitats or species should be checked in the field using an appropriate survey technique undertaken by an appropriately experienced person.

b) The site boundary should be checked using the results of field survey and/or remote sensing techniques.

Stage 2
Assessment

Following Stage 1 a recommendation to confirm, delete or modify the BHS boundary and/or the reasons for its identification, will be considered by the BHS Review Panel either at an Annual Review Meeting or a special meeting convened as part of the local plan review process. Where permission to

re-survey a site has been refused then the recommendation should be based upon the best available information.

4.10

To qualify for inclusion within a local plan review the BHS status of a site should ideally have been confirmed, or the site first identified, within the five year period preceding the publication of the deposit edition of the local plan review.

In practice this would usually mean that the presence of the qualifying features of a BHS and its boundary would be checked every five to ten years.

5. Sites of "Local" Interest

5.1

Some sites which are already included on other existing lists of non-statutory wildlife sites in the County do not meet the standards that have been set in these guidelines. The fact that such sites will not be designated Biological Heritage Sites should not preclude their identification as sites of local wildlife interest by conservation bodies, local authorities or others. Whilst these sites should always be of demonstrable nature conservation value, factors such as their value to the local community, in particular, may be important in their identification and management. Sites identified on this basis are also part of a wider strategy for nature conservation, but fulfil a somewhat different role to the Biological Heritage Sites.

Part B:
Guidelines for the Selection of Biological Heritage Sites


C.M.Isherwood

6. Section 1: Habitat Guidelines

6.1 WOODLAND AND SCRUB

Wd1 Sites included on the *Lancashire Inventory of Ancient Woodland* which support semi-natural woodland vegetation.

Application

All sites listed in the *Inventory* (English Nature 1994a) should be included except for woods which have been felled and replanted with non-native species and have lost most of their ancient features.

Justification

The *Inventory* includes all woods over 2 hectares considered by English Nature on the basis of a desk study to be ancient in origin. As the irreplaceable remnants of the natural `climax' vegetation of most of Lancashire, all such sites are considered an integral part of the County's biological heritage. This also applies to sites which have been extensively modified but retain some of their ancient features, e.g. ground flora elements.

Wd2 Other semi-natural woodlands over 1 hectare where field evidence indicates that they are ancient in origin.

Application

Ancient semi-natural woodlands which are not included in the *Inventory* (see Wd1) can be included here. Woods smaller than 2 hectares are included only if evidence of ancient origin is particularly strong and/or they are especially good examples of particular semi-natural types.

Justification

A small number of ancient semi-natural woods over 2 hectares is missing from the *Inventory* (see Wd1). The 2 hectare minimum size qualification for inclusion in the Inventory is a national standard, whilst most of Lancashire's ancient semi-natural woods are small by national standards. Consequently, there are a number of sites which merit inclusion in terms of habitat quality which are between 1 hectare and 2 hectares in extent.

Wd3

Other woodlands over 2 hectares which add significantly to the biodiversity of the Landscape Zone[1] in which the site occurs.

Application

Woodlands which are mostly of secondary origin but are considered to be important for biodiversity in terms of species or local genetic diversity may be included here. Such sites are generally restricted to areas which now support little or no ancient woodland, e.g. the Fylde (Amounderness).

Justification

Secondary woodland can be an important habitat for many more mobile wildlife species, particularly in areas or situations where ancient woodland is absent or rare. This guideline aims to identify the most important of such sites.

Wd4

Broadleaved woodlands over 2 hectares containing 5 or more trees per hectare estimated to be more than 200 years old.

Application

Woodlands included here may be ancient or mainly secondary and the broadleaved trees concerned may be native or non-native to the area.

Justification

Old and over-mature woodland trees are extremely valuable wildlife habitats. They provide internal spaces for nesting/roosting birds, bats or bees for example, and also habitat continuity needed by other species with very limited powers of dispersal and colonisation. They may also provide valuable evidence of the nature of past woodland management.

Wd5 (a)

Areas of semi-natural woodland or scrub greater than 0.25 hectare referable to one of the following NVC[2] types:

W3 *Salix pentandra - Carex rostrata* woodland.

W17 *Quercus petraea - Betula pubescens - Dicranum majus* woodland

Wd5 (b)

Areas of semi-natural woodland or scrub greater than 0.5 hectare referable to the following NVC[2] types:

W2 *Salix cinerea - Betula pubescens - Phragmites australis* woodland

W4 *Betula pubescens - Molinia caerulea* woodland

W5 *Alnus glutinosa - Carex paniculata* woodland

W7 *Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum* woodland

Alder

(1) See Appendix 1.

(2) National Vegetation Classification, published as Rodwell (1991a)

Wd5 (c)

Areas of semi-natural woodland or scrub greater than 1.0 hectare referable to the following NVC[1] types:

W1 *Salix cinerea - Galium palustre* woodland

W6 *Alnus glutinosa - Urtica dioica* woodland

W23 *Ulex europaeus - Rubus fruticosus* scrub

Application

This guideline should be applied to sites which do not satisfy guidelines Wd1, Wd2 or Wd3. Consideration may be given to the inclusion of stands of the above woodland types less than the areas shown where these occur in association with habitats which comply with other guidelines, and with which they may have a seral relationship. NVC types should be identified by a competent field surveyor familiar with NVC.

Justification

The NVC types shown are either rare woodland types which tend to occur in small stands only, or are more frequent types stands of which are of nature conservation significance at the area thresholds shown, but which may occur isolated from other larger areas of semi-natural woodland. Some of these types are successional stages in the conversion of grassland (or other non-woodland habitats) to woodland. Management of such vegetation might be directed at arresting such a succession, encouraging it or reversing it to create habitat(s) of the greatest value to wildlife, depending on the geographical and ecological context of the site concerned.

6.2 PARKLAND AND SCATTERED TREES

Pk1

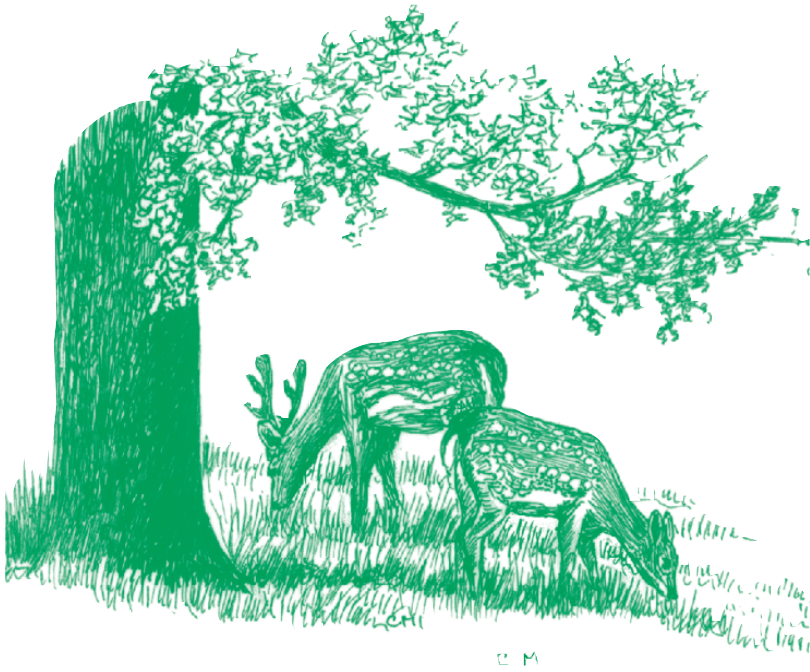
Groups of scattered broad-leaved trees including individuals estimated to be over 200 years old in parkland and similar situations.

Application

Trees may be native or non-native species. In exceptional cases, single trees may be considered for inclusion here.

Justification

See Wd4. In some areas the oldest surviving trees are associated not with present day woodlands (especially where woodland is mainly secondary), but with earlier parkland or in other open situations. Such trees are a rare and increasingly threatened habitat in Lancashire.



(1) National Vegetation Classification, published as Rodwell (1991a)

6.3 GRASSLAND[1]

Gr1 Areas of ancient semi-natural limestone and neutral grasslands over 0.5 hectare identified as one or more of the following NVC[2] types:

- MG3 *Anthoxanthum odoratum - Geranium sylvaticum*
- MG4 *Alopecurus pratensis - Sanguisorba officinalis*
- MG8 *Cynosurus cristatus - Caltha palustris*
- CG2 *Festuca ovina - Avenula pratensis*
- CG6 *Avenula pubescens*
- CG9 *Sesleria albicans - Galium sterneri*
- CG10 *Festuca ovina - Agrostis capillaris - Thymus praecox*

Application

This guideline is to be applied only to sites which have been identified as referable to one or more of the NVC types shown above by a competent field surveyor with adequate training and experience in the National Vegetation Classification. Sown "wildflower meadows" and semi-natural grasslands of known recent origin are not eligible for inclusion.

Justification

The presence of these NVC types indicates grassland which, although often of agricultural origin, has not been subject to intensive production involving use of inorganic nitrogen or post-war ploughing and reseeding. Although MG8, for example, was probably widespread in former times, most of these grasslands will always have been of localised occurrence. All are now rare as a result of agricultural improvement over many years. They are rich in native plant species including many which are mainly restricted to them, and are irreplaceable in practice.

Those non-agricultural grasslands which are eligible for inclusion here are likely to be those which originated before the widespread loss of species-rich agricultural grasslands, and would have been colonised from such grasslands which formerly existed in the same locality.

Gr2 (a) Areas of semi-natural acid grassland (as defined by NVC[2]) over 0.5 hectare in Landscape Character Tracts A, B and C.

Application

This guideline may be applied to any area of established acidic grassland, irrespective of origin, provided it fulfils the criteria set down in the guideline.

Justification

Acidic grassland of any kind is a rare habitat in the coastal zone.

Gr2 (b) Representative examples of acid grassland (as defined by NVC[2]) over 0.5 hectare may be included outside Landscape Character Tracts A, B and C where they contribute to the habitat and species diversity of sites selected on the basis of other guidelines.

Application

This may be applied to areas of acidic grassland which form part of an upland vegetation mosaic but is usually restricted to those which are relatively species-rich, including such characteristic species as *Polygala serpyllifolia*, and *Carex* species such as *C. pilulifera*, *C. nigra* or *C. binervis*.

Justification

Upland acidic grassland in Lancashire is generally of rather low diversity in terms of flowering plants at least. Its conservation value is generally assumed to be relatively low but is not well-studied.

Some areas have been identified as Biological Heritage Sites on the basis of their breeding birds (see species guidelines). Otherwise existing information on this habitat is inadequate for the formulation of more definite selection guidelines of the kind which appear for limestone or neutral grasslands.

(1) Note that "marshy grasslands" identified on the Phase 1 Habitat Survey are not distinguished as such by the NVC, but classified under either neutral grassland or swamp/fen or mire.

(2) National Vegetation Classification, published as Rodwell, (1992)

Gr3

Areas of old established semi-natural grassland over 0.5 hectare, including sites referable to the following NVC[1] types, with 10 or more species in Table 1:

- MG1 *Arrhenatherum elatius*
- MG5 *Cynosurus cristatus - Centaurea nigra*
- MG6 *Lolium perenne - Cynosurus cristatus*
- MG9 *Holcus lanatus - Deschampsia cespitosa*
- MG10 *Holcus lanatus - Juncus effusus*

Application

Whilst appropriate sites will, in the main, be referable to one or more of the NVC types listed above, this guideline may be applied to grassland of any NVC type, or where NVC type has not been determined, provided that the conditions in this and the next paragraph are fulfilled. Sites should meet one or both of the following criteria. Either they are ancient grasslands (estimated to be at least 100 years old), or are other old-established grasslands which are indistinguishable in practice from ancient grasslands both in terms of their species composition and structure. Sown "wildflower meadows", developing semi-natural grasslands of known recent origin, and other grasslands which do not meet either of these criteria are not eligible for inclusion here.

Table 1 includes a representative selection of species which are characteristic of species-rich (low-fertility) grasslands. It includes species of neutral, limestone and flushed grasslands; experience in Lancashire has shown that good examples of these major semi-natural grassland types, either singly or in combination (as is frequently the case on the ground), can be identified using this table. The species concerned should be reasonably well-distributed over the whole or a significant part of the site. Sites which support 10 or more species in Table 1 but where a high proportion of those species are very rare or restricted to non-typical patches or the edges of the site would not normally be included.

Justification

Ancient species-rich semi-natural grasslands are an important part of Lancashire's critical environmental capital which is difficult or impossible to replace once destroyed. Now uncommon, they are being lost faster than any other type of wildlife habitat. They are extremely vulnerable to agricultural improvement, since many species are lost when soil fertility is increased, and also to neglect. It is therefore

(1) National Vegetation Classification, published as Rodwell (1992).

important to identify those that remain and to encourage their conservation by means of schemes such as Countryside Stewardship as a matter of urgency.

Each of the NVC types listed under this guideline can vary widely in its conservation value from one site to another. Even MG5 grassland, which is usually unimproved species-rich agricultural grassland, can occasionally include sites which are not species-rich and of doubtful conservation value. This guideline provides a means of determining which of the sites referable to these NVC types are of high conservation value. The guideline also takes account of the facts that firstly, some sites of nature conservation importance are mixtures of different NVC types, and secondly that many sites have not yet been surveyed using NVC.

Those non-agricultural grasslands which are eligible for inclusion here are likely to be those which originated before the widespread loss of species-rich agricultural grasslands, and would have been colonised from such grasslands which formerly existed in the same locality.

Table 1. Plant species of semi-natural grasslands[1] (See Guideline Gr3)

Plant species of semi-natural grasslands

SCIENTIFIC NAME	COMMON NAME
Achillea ptarmica	Sneezewort
Ajuga reptans	Bugle
Alchemilla spp	Lady's-mantle
Anemone nemorosa	Wood Anemone
Anthyllis vulneraria	Kidney vetch
Botrychium lunaria	Moonwort
Briza media	Quaking-grass
Caltha palustris	Marsh-marigold
Campanula rotundifolia	Harebell
Carex caryophyllea	Spring Sedge
Carex disticha	Brown Sedge
Carex flacca	Glaucous Sedge
Carex hostiana	Tawny Sedge
Carex pallescens	Pale Sedge
Carex panicea	Carnation Sedge
Carex pulicaris	Flea Sedge
Carex spicata	Spiked Sedge
Centaurea nigra	Common Knapweed
Cirsium heterophyllum	Melancholy Thistle
Conopodium majus	Pignut
Crepis paludosa	Marsh Hawk's-beard

(1) Scientific and common names are taken from Stace 2nd Ed (1997)

Plant species of semi-natural grasslands

Dactylorhiza spp.	Marsh and Spotted-orchids
Danthonia decumbens	Heath-grass
Equisetum sylvaticum	Wood Horsetail
Euphrasia spp	Eyebright
Filipendula ulmaria	Meadowsweet
Galium sterneri	Limestone Bedstraw
Galium verum	Lady's Bedstraw
Genista tinctoria	Dyer's Greenweed
Geranium columbinum	Long-stalked Crane's-bill
Geranium pratense	Meadow Crane's-bill
Geranium sylvaticum	Wood Crane's-bill
Geum rivale	Water Avens
Gymnadenia conopsea	Fragrant Orchid
Helianthemum nummularium	Common Rock-rose
Helictotrichon pubescens	Downy Oat-grass
Helictotrichon pratense	Meadow Oat-grass
Hyacinthoides non-scripta	Bluebell
Hypericum pulchrum	Slender St. John's-wort
Hypochoeris radicata	Cat's-ear
Knautia arvensis	Field Scabious
Lathyrus linifolius	Bitter-vetch
Lathyrus pratensis	Meadow Vetchling
Leontodon autumnalis	Autumn Hawkbit
Leontodon hispidus	Rough Hawkbit
Leucanthemum vulgare	Oxeye Daisy
Linum cartharticum	Fairy Flax
Listera ovata	Common Twayblade
Lotus corniculatus	Common Bird's-foot-trefoil
Lotus pedunculatus	Greater Bird's-foot-trefoil
Luzula campestris/multiflora	Field/Heath Wood-rush
Lychnis flos-cuculi	Ragged-Robin
Ophioglossum vulgatum	Adder's-tongue
Orchis mascula	Early-purple Orchid

Plant species of semi-natural grasslands

Parnassia palustris	Grass-of-Parnassus
Pedicularis sylvatica	Lousewort
Pilosella officinarum	Mouse-ear Hawkweed
Pimpinella major	Greater Burnet-saxifrage
Pimpinella saxifraga	Burnet-saxifrage
Polygala spp.	Milkwort
Polygonum bistorta	Common Bistort
Primula farinosa	Bird's-eye Primrose
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Ranunculus bulbosus	Bulbous Buttercup
Rhinanthus minor	Yellow-rattle
Sanguisorba officinalis	Great Burnet
Sanguisorba minor	Salad Burnet
Saxifraga granulata	Meadow Saxifrage
Saxifraga tridactylites	Rue-leaved Saxifrage
Scabiosa columbaria	Small Scabious
Serratula tinctoria	Saw-wort
Sesleria caerulea	Blue Moor-grass
Stachys officinalis	Betony
Stellaria graminea	Lesser Stitchwort
Succisa pratensis	Devil's-bit Scabious
Taraxacum sect. *Erythrosperma*	Dandelion
Taraxacum sect. *Spectabilia* or *Naevosa*	Dandelion
Thalictrum flavum	Common Meadow-rue
Thymus polytrichus	Wild Thyme
Trifolium medium	Zigzag Clover
Trisetum flavescens	Yellow Oat-grass
Trollius europaeus	Globeflower
Valeriana dioica	Marsh Valerian
Veronica officinalis	Heath Speedwell

6.4 SWAMP AND FEN

Application (all swamp and fen guidelines)

This category includes a variety of wetland habitats which receive their water not only from rainfall but also from groundwater sources. They include open water transitions, flood-plain and basin mires, valley mires and flushes and "fen-meadows" as defined in NCC (1989).

Fe1 Swamp and fen sites over 0.5 hectare and in excess of 20m wide. Species-poor examples of the following NVC[1] types may, however, be excluded:

- S10 *Equisetum fluviatile* swamp
- S12 *Typha latifolia* swamp (sites less than 1 hectare only)
- S22 *Glyceria fluitans* swamp
- S28 *Phalaris arundinacea* fen
- M23 *Juncus effusus/acutiflorus - Galium palustre* pasture
- M25 *Molinia caerulea - Potentilla erecta* mire

Application

This guideline should be applied to all swamp and fen sites which fall in those categories listed after the main title, and which are defined in NCC (1989).

Justification

With a few exceptions, swamp and fen habitats in Lancashire are small and highly fragmented. Any sites meeting the criteria given are of significant nature conservation value, with the possible exceptions of those NVC types listed. The latter are generally of lower nature conservation interest, and in some cases, at least, may be readily re-created. Whilst particular sites may be more valuable, they cannot in general be considered to be automatically part of the County's "critical environmental capital" (see Introduction, para. 2.1).

Fe2 Swamp and fen sites (flushes) with 4 or more of the species listed in Table 2.

Application

This guideline is to be applied to flushes or flush-systems less than 0.5 hectare in extent.

Justification

Provided that they remain unaffected by inorganic nitrogenous fertilisers, small areas which are flushed by ground water emerging at seepages or springs often contain a high proportion of the botanical diversity of the upland or upland fringe environments in which they are found. They are an important refuge for decreasing species which were formerly found in bogs (see following section) before widespread drainage, burning and heavy grazing eliminated them. The plant species listed in Table 2 are characteristic of flushes which remain largely unaffected by agricultural improvement.

Common Butterwort

(1) National Vegetation Classification, published as Rodwell (1995).

TABLE 2. Plant species of swamp and fen[1] (See Guidline Fe 2)

Plant species of swamp and fen

SCIENTIFIC NAME	COMMON NAME
Anagallis tenella	Bog Pimpernel
Andromeda polifolia	Bog Rosemary
Carex curta	White Sedge
Carex dioica	Dioecious Sedge
Carex disticha	Brown Sedge
Carex hostiana	Tawny Sedge
Carex viridula	Yellow Sedge
Carex pulicaris	Flea Sedge
Carex rostrata	Bottle Sedge
Dactylorhiza maculata	Heath Spotted-orchid
Drosera rotundifolia	Round-leaved Sundew
Eleocharis quinqueflora	Few-flowered Spike-rush
Galium uliginosum	Fen Bedstraw
Hydrocotyle vulgaris	Marsh Pennywort
Menyanthes trifoliata	Bogbean
Narthecium ossifragum	Bog Asphodel
Parnassia palustris	Grass-of-Parnassus
Pedicularis sylvatica	Lousewort
Pinguicula vulgaris	Common Butterwort
Potamogeton polygonifolius	Bog Pondweed
Potentilla palustris	Marsh Cinquefoil
Selaginella selaginoides	Lesser Clubmoss
Salix repens	Creeping Willow
Trichophorum cespitosum	Deergrass
Triglochin palustris	Marsh Arrowgrass
Trollius europaeus	Globeflower
Vaccinium oxycoccus	Cranberry
Valeriana dioica	Marsh Valerian

(1) Scientific and common names are taken from Stace 2nd Ed. (1997).

Fe3 The best examples of each of the following topographical or hydrological types of swamp and fen remaining in each of the Landscape Zones[1] where they occur, should these fail to meet guidelines Fe1 and Fe2.

- Floodplain fen
- Springs and flushes
- Basin fen
- Fen meadow
- Open water transitions
- Shelf or spur mire
- Valley mire

Application

The best examples are identified on the basis of the relevant NCR criteria, and more particularly on the detailed guidance given for each of the listed topographical/hydrological types in NCC (1989) (pp138-148).

Some mire systems are mosaics of swamp and fen, and bog habitats (see Guideline Bo5), or are intermediate in character. Such sites may be considered for inclusion under guidelines Fe3 or Bo5, whichever is the more appropriate.

Justification

In view of the rarity and vulnerability of many swamps and fens, it is considered important that the guidelines should identify the best remaining examples of all major types of swamp and fen in Lancashire, even if the only surviving examples of a particular type fail to meet Guidelines Fe1 or Fe2.

6.5 BOG

~~Application (all bog guidelines)~~

~~Bogs receive their water and nutrients primarily from rainfall and not from groundwater sources (*cf.* swamp and fen). They include raised bog (or moss) and blanket bog as defined in JNCC (1994). Bogs will normally comprise semi-natural vegetation developed over peat more than 0.5m deep (*cf.* heathland).~~

~~Justification (all bog guidelines)~~

~~The bogs of north and west Britain are collectively of international nature conservation significance. However, most of Lancashire's bogs have been either destroyed (in the lowlands) or else severely degraded. These guidelines aim to identify all remnants of a formerly widespread and highly characteristic vegetation type in the County which are still of nature conservation importance.~~

~~Bo1~~ ~~Lowland bog (mossland) sites over 0.5 hectare in extent in Landscape Zone West[1] over peat more than 0.5 metre deep which support semi-natural vegetation.~~

~~Application~~

~~Although sites which have been afforested are generally excluded here, those with some tree cover but which retain elements of their characteristic bog plant or animal communities may be considered for inclusion.~~

~~Justification~~

~~About 98% of the lowland raised mosses of Lancashire have now been reclaimed for agriculture or otherwise lost (Lancashire County Council n.d.). The habitat is now so rare that all uncultivated remnants (whether they are cut over and regenerated or not) larger than 0.5 hectare are considered to be of importance, and a key part of the County's "critical environmental capital" (see Introduction, para. 2.1).~~

(1) See Appendix 1.

REVISED GUIDELINES FOR SELECTION OF BIOLOGICAL HERITAGE SITES (2007)

(These Guidelines relating to bog habitat replace those in the Biological Heritage Sites Guidelines for Site Selection, published in 1998)

6.5 BOG

Application (all bog guidelines)

Bogs receive their water and nutrients primarily from rainfall and not from groundwater sources (cf. swamp and fen). They include lowland raised bog (mossland) and the upland (in England) blanket bog, as defined in JNCC (1994). However, the term 'blanket bog' may be appropriately replaced by 'blanket mire' to describe the expansive areas of this habitat in the uplands where there is water movement over or through large areas of blanket peat or from mineral rock/soil intrusions.

Bogs would naturally have a distinctive type of peat-forming vegetation composed of acid-loving plants, especially *Sphagnum* mosses, on peat 0.5m or more in deep. This peat depth is normally used to distinguish bog from heath, which rarely achieves this depth. Due to human activities, as elsewhere, bogs in Lancashire are modified or degraded to a lesser or greater extent. As a consequence their vegetation may be sub-optimal and peat depths may be somewhat reduced.

Bogs supporting a significant area of vegetation that is normally peat-forming are defined as 'Active' (JNCC 2005), and typically, include important peat-forming species such as bog-mosses *Sphagnum* spp. and Cottongrasses *Eriophorum* spp., or Purple Moor-grass *Molinia caerulea* in certain circumstances, together with Heather *Calluna vulgaris* and other ericaceous species. Such peat-forming vegetation occurs over bogs in Lancashire, being well represented in upland situations. Active raised bog and Blanket bog are priority habitat types within the EC Council Directive 92/43/EEC (Habitats Directive). . Through the Directive, the Annex 1 feature, Raised mire, assumes a unique status in that they can be designated as Special Areas of Conservation (SACs) on their potential to resume peat formation if managed correctly (Jackson, D.L. & McLeod, C.R. Eds, 2000). In terms of Biological Heritage Sites this potential is extended to Blanket bogs. In this respect the guidelines not only aim to select and safeguard all remnants supporting distinctive vegetation but also those with the potential to become active bogs through appropriate management.

Lowland raised bogs in Lancashire generally survive as relict well-defined features in an otherwise significantly modified landscape. Three mesotopes (JNCC 1994), Flood-plain raised bog, Estuarine raised mire and Basin raised bog, may be represented in Lancashire. However, relict Lowland raised bog is now so rare in Lancashire that all surviving examples are considered important. In upland Lancashire Blanket bog is better represented and comprises four hydrological types, Watershed Mire, Valleyside Mire, Spur Mire and Saddle Mire mesotopes; the Waterside-valleyside Mire mesotope is also present (JNCC 1994). Site boundaries should seek to reflect the integrity of the peat body in terms of either one or more mesotopes, large scale topographical features or other physical boundaries, whichever is considered most appropriate. Areas of thinner peat contiguous to or occurring locally within a bog may be included within sites where it is considered they form an integral part of the bog or where the land is considered important in terms of contributing to the hydrological integrity.

Intermediate mires, those showing characteristics of both Lowland raised mire and Blanket bog, may be selected under whichever bog guideline is considered appropriate.

Justification (all bog guidelines)

The bogs of north and west Britain are collectively of international nature conservation significance, with a selection having SSSI, SAC and Ramsar designations. In the lowlands most of Lancashire's bogs (mossland or lowland raised mire) have been either destroyed or else degraded. In the uplands more extensive tracts of bog (blanket bog or mire) remain but these also have been modified to a lesser or greater extent. Nevertheless Lancashire still retains a significant proportion of the English resource and its conservation and restoration is important in delivering UK BAP targets. As a formerly widespread and characteristic natural feature of Lancashire, they are of high nature conservation importance because of what they represent in terms of habitat history, structure and function, and for their flora and fauna. The importance of bogs as carbon stores is now widely recognised and increases their conservation importance. Together with some fens, they are collectively the most long-term sinks of atmospheric carbon dioxide but will remain net contributors to the atmosphere unless peat is once more enabled to form. Whilst selecting bogs for their intrinsic biodiversity value, these guidelines also aim to identify all viable remnants that, under favourable management, would be capable of peat formation.

Both Lowland raised mire and Blanket bog are UK Biodiversity Action Plan Priority Habitats, their selection as sites is an integral part of BAP delivery.

Bo1	**Lowland bog (mossland) sites over 0.5 hectare in extent which support semi-natural vegetation.**

Application

All sites supporting semi-natural vegetation should be selected and may include cut-over, drained or afforested bog.

Justification

About 98% of lowland raised mosses of Lancashire have now been reclaimed for agriculture or otherwise lost (Lancashire County Council n.d.). The habitat is now so rare that all uncultivated remnants (whether they are cut over and regenerated or not) larger than 0.5 hectare are considered to be of importance, a key part of the County's "critical environmental capital"(see Introduction, para. 2.1).

Bo2 (a)	**Bog sites with at least 25% cover of *Sphagnum* (bog-moss) over a minimum area of 0.5 hectare.**

Application

This guideline may be applied either to relict areas of *Sphagnum* cover, or areas of regenerating *Sphagnum* cover.

Justification

Bogs with a high percentage of Sphagnum cover indicate either relatively little disturbance in the past or a regenerating bog-moss surface following the onset of more favourable local environmental conditions.

Sphagnum mosses are lost from bogs subject to systematic drainage and/or burning. They provide the building material and habitat matrix for 'classical' raised and blanket bogs which support a number of rare and decreasing species (including rare species of *Sphagnum* itself)

Bo2 (b) Bog sites supporting 8 or more species of *Sphagnum* mosses.

Application

This guideline may be applied to any area of bog (Lowland raised bog or Blanket mire) supporting 8 or more species of *Sphagnum* mosses. A list of species associated with such habitats in Lancashire includes:

Sphagnum capillifolium	Red and Acute-leaved Bog-moss
Sphagnum cuspidatum	Feathery Bog-moss
Sphagnum denticulatum	Cow-horn Bog-moss
Sphagnum fallax	Flat-topped Bog-moss
Sphagnum fimbriatum	Fringed Bog-moss
Sphagnum flexuosum	Flexuous Bog-moss
Sphagnum girgensohnii	Girgensohn's Bog-moss
Sphagnum magellanicum	Magellanic Bog-moss
Sphagnum palustre	Blunt-leaved Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum russowii	Russow's Bog-moss
Sphagnum squarrosum	Spiky Bog-moss
Sphagnum subnitens	Lustrous Bog-moss
Sphagnum tenellum	Soft Bog-moss

Justification

Bogs supporting a diversity of *Sphagnum* mosses are indicative of better quality habitat with a range of surface or structural features. As stated under Bo2(a) they may indicate bogs with relatively little past disturbance or be associated with regenerating bogs where more favourable conditions prevail. Whilst certain species are associated with different types of wetter bog-pools or silting-up 'grips', others are associated with vegetation on 'drier' bog surfaces. Very often their frequency may be obscured by growing beneath and between hummocks of Purple Moor-grass (*Molinia caerulea*) making an assessment of their abundance (as in Bo2(a)) near impossible.

Bo3 (a) Bog containing 3 or more species in Table 3a

Application

Species listed need only be present, irrespective of their abundance or distribution on the site concerned.

Justification (unchanged)

Few, if any, of the listed species will occur in those bogs which have been severely degraded by drainage, burning and heavy grazing. They are valuable indicators of more natural conditions which are now rare in Lancashire's bogs.

Table 3a. Plant species of bogs [(1)] (See Guideline Bo3a)

Plant species of bogs	Scientific Name	Common Name
	Andromeda polifolia	Bog Rosemary
	Drosera rotundifolia	Round-leaved sundew
	Erica tetralix	Cross-leaved Heath
	Myrica gale	Bog Myrtle
	Narthecium ossifragum	Bog Asphodel
	Trichophorum cespitosum	Deergrass
	Vaccinium oxycoccus	Cranberry

Bo3 (b) Bog containing 3 or more species in Table 3b

Application

Species listed need only be present, irrespective of their abundance or distribution on the site concerned.

Justification

Few, if any, of the listed species occur in those bogs which are severely degraded by drainage, burning and heavy grazing. They are indicators of more natural conditions or situations where more favourable conditions have enabled populations to re-establish.

Table 3b. Plant species of bogs (See Guideline Bo3)

Plant species of bogs	Scientific Name	Common Name
	Sphagnum capillifolium (ssp. *capillifolium* or ssp. *rubellum*)	Acute-leaved Bog-moss or Red Bog-moss
	Sphagnum magellanicum	Magellanic Bog-moss
	Sphagnum papillosum	Papillose Bog-moss
	Sphagnum subnitens ssp. *subnitens*	Lustrous Bog-moss
	Sphagnum tenellum	Soft Bog-moss

Bo4	**Areas greater than 10 hectare in which any of the following dwarf shrubs, either individually or in combination, have more than 25% average cover:** ***Calluna vulgaris*** **Heather** ***Vaccinium myrtillus*** **Bilberry** ***Empetrum nigrum*** **Crowberry**

Application

This guideline should be applied to areas of peat with a depth of at least 0.5 metres; they may be dry through drainage (gripping) or may have been cutover in the past. Whilst dwarf shrubs may dominate some sites, others may comprise mosaics often involving species associated with wetter conditions or acidic grassland. However, some areas dominated by dwarf shrubs are, in fact, mosaics of bog and heathland (see Guideline He 1) and cannot be readily differentiated. Where such areas otherwise comply with the terms of Guideline Bo4 or He1 they may be selected under whichever is the most appropriate guideline.

Justification

Although much modified by human activities, larger areas of drier bog in which dwarf shrubs are a major component are of conservation value in terms of maintaining biodiversity resources of the region. Peripheral areas of thinner peat not readily differentiated from Heath represent a contiguous habitat and are likely to be important to the integrity of the peat mass. They may also represent the historic boundaries of the peat body. These sites contain a significant carbon store.

Bo5	**Areas of upland peat comprising the following topographical or hydrological types of blanket mire mesotopes:** **Watershed mire** **Spur mire** **Valleyside mire** **Saddle mire** **Waterside-Valleyside**

Application

Sites should be selected on the basis of topographical or hydrological function in terms of the blanket mire mesotopes in JNCC (1994). This guideline should be applied to those areas of peat (primarily >0.5m) that may not support the quality of vegetation required by the other Bog guidelines (although they will normally support some form of semi-natural vegetation) but nevertheless represent a biodiversity resource in terms of comprising at least one coherent mesotope. Some mire systems are, in fact, mosaics of Bog and Fen habitats, or are intermediate in character, such sites may be considered for inclusion under whichever guideline is the more appropriate.

Justification

Blanket mire is an internationally important habitat with Lancashire supporting an important proportion of the English resource. Whilst blanket mire is valued for the flora and fauna it supports, it is nevertheless important historically and as a store of carbon. Degraded Blanket mires retaining deposits of peat, which given favourable conditions, are considered capable of functioning as active bog, are important for biodiversity and as 'sink' for atmospheric carbon dioxide. In these respects it is considered that such blanket mires should be identified as sites.

References

See main guidelines

Jackson, D.L. & McLeod, C.R. (Editors), (2000), Handbook on the UK status of EC Habitats Directive interest features: provisional data on the UK distribution and extent of Annex I habitats and the UK distribution and population size of Annex II species, Revised 2002, JNCC Report 312, 180 pages, ISSN 0963 8091

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(http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H7130)

Acknowledgements

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Bo5 ~~The best examples of each of the following topographical or hydrological types of blanket bog remaining in each of the Landscape Zones[1] in which they occur, should these fail to meet other Bog guidelines.~~

~~Watershed mire~~ ~~Spur mire~~

~~Valleyside mire~~ ~~Saddle mire~~

~~Application~~

~~The best examples are selected on the basis of established general NCR criteria, and more particularly on the detailed guidance given for each of the listed topographical/hydrological types in NCC 1989 (pp166-170). Some mire systems are, in fact, mosaics of bog, and swamp and fen habitat (see Guideline Fe3), or are intermediate in character. Such sites may be considered for inclusion under Guidelines Bo5 or Fe3, whichever is the more appropriate.~~

~~Justification~~

~~In view of the drained and degraded state of much of the County's blanket bog, it is considered important that the best remaining examples of the principal types of bog formation should be identified, even if these fail to meet the other guidelines in this section.~~

Cross-leaved Heath

6.6 HEATHLAND

Application (all heathland guidelines)

The term `heathland' refers to areas of semi-natural vegetation in which dwarf shrubs are prominent developed over mineral soils or on peat less than 0.5m deep.

Justification (all heathland guidelines)

Ancient heathland, found only in the unenclosed uplands of Lancashire, is a valuable wildlife habitat. Heathland is a rare habitat in the lowlands, now restricted to small pockets of land which are usually associated with former mineral workings.

He1 Areas greater than 10 hectares in which any of the following dwarf shrubs, either individually or in combination, have more than 25% cover:

Calluna vulgaris	Heather
Vaccinium myrtillus	Bilberry
Empetrum nigrum	Crowberry

Application

Some areas dominated by dwarf shrubs are, in fact, mosaics of bog (see Guideline Bo4) and heathland and cannot be readily differentiated. Where such areas comply with the terms of Guidelines He1 or Bo4 they may be selected under whichever is the most appropriate guideline.

He2 Areas of heathland greater than 2 hectares in Landscape Character Tracts Ei and Eii[1] in which any of the dwarf shrubs listed in He1, either individually or in combination, have more than 25% cover.

He3 Areas of heathland greater than 0.5 hectares in Landscape Zone West[1] in which any of the dwarf shrubs listed in He1, either individually or in combination, have more than 25% cover.

(1) See Appendix 1

6.7 FRESHWATER HABITATS

I) RIVERS AND STREAMS

Ri1 Detailed guidelines are not yet available. Many of Lancashire's rivers, especially those in the Landscape Zone North[1], are considered to be of high nature conservation value. Several major rivers are included in the present list on the basis of available knowledge of riverside habitat quality and/or populations of species. Otherwise, because of the limited amount of information on the biological content of the aquatic environment itself, identification of Biological Heritage Sites is limited to:

a) localised river or stream habitats which meet other habitat or species guidelines; or

b) small streams included in large sites identified primarily on other grounds.

Application

As river courses can change appreciably from year to year, boundaries can be difficult to define. Where appropriate they should include all associated shingle beds, earth banks and fringing trees, shrubs and grassy banks, as well as habitats such as pools, ditches and marshes associated with the lines of old watercourses.

In addition, parts of the flood plain may also be included in order to protect the requirements of breeding and overwintering birds.

II) PONDS

Po1 Standing water bodies less than 2 hectares with a Lancashire Pond Score equal to or greater than 1.5.

Calculating the Lancashire Pond Score:

1) Record the presence of all species of flowering plants and ferns growing within an area defined by the actual or supposed winter high water level of the water body.

2) Sum the scores of species present according to Table 4. Species known to have been deliberately introduced to the site concerned are scored 1. Species not included in Table 4 do not receive a score. This sum gives the Lancashire Plant Conservation Score.

3) Divide the Lancashire Plant Conservation Score by the number of species recorded from Table 4, to determine the Lancashire Plant Conservation Index.

4) Add the appropriate Diversity Factor from Table 5 to the Lancashire Plant Conservation Index to give the Lancashire Pond Score.

Some of the more commonly introduced species have been assigned two scores in Table 4: the higher score should be used only for sites where the species is known or believed to be of native occurrence.

(1) See Appendix 1

Application

This guideline applies to ponds which are defined as permanent or seasonal bodies of standing water less than 2 hectares, and can be of natural or (usually) man-made origin.

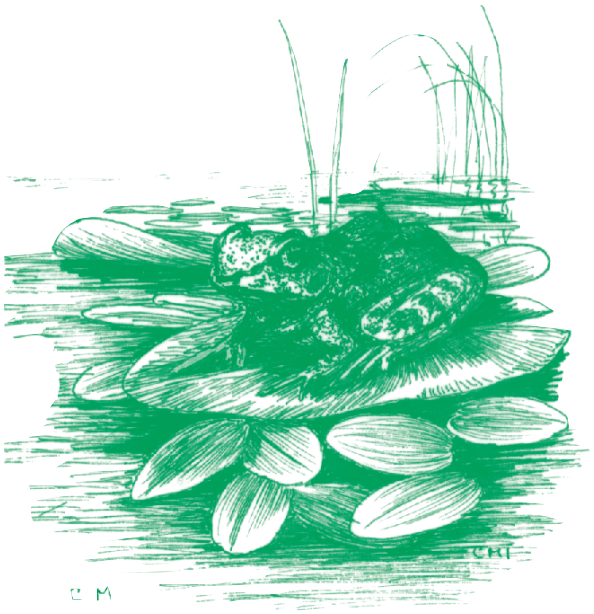
Tests indicate that the guideline can be applied satisfactorily to most types of pond, including brackish and nutrient-poor types, as well as the more usual nutrient-rich (eutrophic) ponds.

Site boundaries may also include adjacent areas of semi-natural terrestrial habitat as well as the water body itself.

Justification

Although natural bodies of standing water are rare in Lancashire, parts of lowland Lancashire are particularly rich in field ponds. Some of these are important for individual plant and animal species, including amphibians. Others, although sometimes in the midst of intensively cultivated agricultural land are refuges for a range of wildlife which add significantly to the biodiversity of such landscapes. This guideline aims to identify the most important of those ponds in this second category.

The Lancashire Pond Score is a measure of the relative nature conservation value of a pond based upon the occurrence and diversity of flowering plants. The methodology is adapted from that developed for the National Pond Survey, as described in Pond Action (1994; 1998). This uses a scored plant list to assess the conservation value of ponds at a national level in terms of a "Plant National Conservation Score" and a "Plant National Conservation Index". The list of plant species in Table 4 has been adapted from a list of plants used for the national survey, omitting all national Red Data Book species, none of which occur, or are likely to occur, in Lancashire. Species scores are also based on those used in the national survey, and have been devised as follows:



i)	Nationally Scarce (16-30 10 x 10km squares in GB)	8
or ii)	Provisional Lancashire Red Data List of Vascular Plants(2) (Endangered)	
i)	Nationally Scarce (31-100 10 x 10km squares in GB)	4
or ii)	Provisional Lancashire Red Data List of Vascular Plants(2)) (Vulnerable)	
i)	Regionally local species(1)	2
or ii)	Provisional Lancashire Red Data List of Vascular Plants(2) (Sensitive)	
i)	All other wetland species (Table 4)	1
or ii)	All deliberate introductions	

Table 4 contains several species which are not native to Great Britain. These are all given a score of 1, and are included not so much for their intrinsic interest but because they may add structural diversity and contribute microhabitats to the pond environment.

The use of an index, as opposed to a simple measure of species diversity, allows the use of a single system to assess a wide range of a different pond types, some of which are intrinsically species-poor compared to others.

However, the index will tend to be relatively low for ponds which have a high diversity of low-scoring (common) species. For this reason, a diversity factor has been added to the index: this is based on a tangential function of the number of species present, and progressively weights high diversity, thus compensating for the tendency of the index to penalise high diversity (Table 5).

The character of the land surrounding a pond can significantly affect the wildlife value of the pond. Adjacent areas of semi-natural vegetation for example, provide additional niches for amphibians and other species, and may help to mitigate against adverse effects of surrounding activities e.g. fertiliser run-off.

(1) Regionally local species are those which are deemed to be "local" in the regional context (northern England) by Pond Action.

(2) Lancashire County Council (in prep.)

TABLE 4. Individual species scores for the Lancashire Plant Conservation Score[1] (see Guideline Po1)

Individual species scores for the Lancashire Plant Conservation Score

SCORE	SCIENTIFIC NAME	COMMON NAME
1	*Achillea ptarmica*	Sneezewort
1	*Acorus calamus*	Sweet-flag
1	*Agrostis stolonifera*	Creeping Bent
4	*Alisma lanceolatum*	Narrow-leaved Water-plantain
1	*Alisma plantago-aquatica*	Water-plantain
1	*Alnus glutinosa*	Alder
8	*Alopecurus aequalis*	Orange Foxtail
1	*Alopecurus geniculatus*	Marsh Foxtail
2	*Anagallis tenella*	Bog Pimpernel
2	*Andromeda polifolia*	Bog-rosemary
1	*Angelica archangelica*	Garden Angelica
1	*Angelica sylvestris*	Wild Angelica
2	*Apium graveolens*	Wild Celery
4	*Apium inundatum*	Lesser Marshwort
1	*Apium nodiflorum*	Fool's Water-cress
1	*Azolla filiculoides*	Water Fern
4	*Baldellia ranunculoides*	Lesser Water-plantain
1	*Barbarea intermedia*	Medium-flowered Winter-cress
1	*Barbarea vulgaris*	Winter-cress
2	*Berula erecta*	Lesser Water-parsnip
2	*Bidens cernua*	Nodding Bur-marigold
2	*Bidens tripartita*	Trifid Bur-marigold
8	*Blysmus compressus*	Flat-sedge
2	*Butomus umbellatus*	Flowering Rush
8	*Calamagrostis canescens*	Purple Small-reed
2	*Calamagrostis epigejos*	Wood Small-reed
8	*Callitriche brutia*	Pedunculate Water-starwort
2	*Callitriche hamulata*	Intermediate Water-starwort
2	*Callitriche hermaphroditica*	Autumnal Water-starwort
4	*Callitriche obtusangula*	Blunt-fruited Water-starwort
2	*Callitriche platycarpa*	Various-leaved Water-starwort
1	*Callitriche stagnalis*	Common Water-starwort
8	*Callitriche truncata*	Short-leaved Water-starwort

(1) Scientific and common names are taken from Stace 2nd Ed. (1997)

1	*Callitriche* agg. (only when *C. stagnalis* not recorded)	Water-starwort
1	*Caltha palustris*	Marsh-marigold
1	*Cardamine amara*	Large Bitter-cress
1	*Cardamine pratensis*	Cuckooflower
4	*Carex acuta*	Slender Tufted-sedge
1	*Carex acutiformis*	Lesser Pond-sedge
8	*Carex approprinquata*	Fibrous Tussock-sedge
8	*Carex aquatilis*	Water Sedge
2	*Carex curta*	White Sedge
8	*Carex diandra*	Lesser Tussock-sedge
1	*Carex disticha*	Brown Sedge
1	*Carex echinata*	Star Sedge
2	*Carex elata*	Tufted Sedge
8	*Carex elongata*	Elongated Sedge
1	*Carex flacca*	Glaucous Sedge
2	*Carex hostiana*	Tawny Sedge
2	*Carex laevigata*	Smooth-stalked Sedge
8	*Carex lasiocarpa*	Slender Sedge
8	*Carex limosa*	Bog-sedge
1	*Carex nigra*	Common Sedge
2	*Carex otrubae*	False Fox-sedge
1	*Carex panicea*	Carnation Sedge
2	*Carex paniculata*	Greater Tussock-sedge
2	*Carex pendula*	Pendulous Sedge
2	*Carex pseudocyperus*	Cyperus Sedge
1	*Carex pulicaris*	Flea Sedge
8	*Carex riparia*	Great Pond-sedge
1	*Carex rostrata*	Bottle Sedge
2	*Carex spicata*	Spiked Sedge
4	*Carex vesicaria*	Bladder-sedge
2	*Carex viridula* ssp. *brachyrrhyncha*	Long-stalked Yellow-sedge
1	*Carex viridula* ssp. *oedocarpa*	Common Yellow-sedge
8	*Catabrosa aquatica*	Whorl-grass
2	*Ceratophyllum demersum*	Rigid Hornwort
8	*Ceratophyllum submersum*	Soft Hornwort
8	*Cicuta virosa*	Cowbane
4	*Cirsium dissectum*	Meadow Thistle
1	*Cirsium palustre*	Marsh Thistle
8	*Cladium mariscus*	Great Fen-sedge
1	*Conium maculatum*	Hemlock
1	*Crassula helmsii*	New Zealand Stonecrop
1	*Crepis paludosa*	Marsh Hawk's-beard
1/8	*Cyperus longus*	Galingale

1	*Dactylorhiza fuchsii*	Common Spotted-orchid
2	*Dactylorhiza incarnata*	Early Marsh-orchid
2	*Dactylorhiza praetermissa/purpurella*	Southern/Northern Marsh-orchid
1	*Deschampsia cespitosa*	Tufted Hair-grass
1	*Drosera rotundifolia*	Round-leaved Sundew
1	*Egeria densa*	Large-flowered Waterweed
8	*Elatine hexandra*	Six-stamened Waterwort
8	*Eleocharis acicularis*	Needle Spike-rush
8	*Eleocharis austriaca*	Northern Spike-rush
8	*Eleocharis multicaulis*	Many-stalked Spike-rush
1	*Eleocharis palustris*	Common Spike-rush
4	*Eleocharis quinqueflora*	Few-flowered Spike-rush
2	*Eleocharis uniglumis*	Slender Spike-rush
1	*Eleocharis* sp. (only when *E. palustris* not recorded)	Spike-rush
8	*Eleogiton fluitans*	Floating Club-rush
1	*Elodea callitrichoides*	South-American Waterweed
1	*Elodea canadensis*	Canadian Waterweed
1	*Elodea nuttallii*	Nuttall's Waterweed
1	*Epilobium brunnescens*	New Zealand Willowherb
1	*Epilobium ciliatum*	American Willowherb
1	*Epilobium hirsutum*	Great Willowherb
1	*Epilobium obscurum*	Short-fruited Willowherb
1	*Epilobium palustre*	Marsh Willowherb
1	*Epilobium parviflorum*	Hoary Willowherb
4	*Epilobium tetragonum*	Square-stalked Willowherb
4	*Epipactis palustris*	Marsh Helleborine
1	*Equisetum fluviatile*	Water Horsetail
1	*Equisetum palustre*	Marsh Horsetail
2	*Erica tetralix*	Cross-leaved Heath
1	*Eriophorum angustifolium*	Common Cottongrass
8	*Eriophorum latifolium*	Broad-leaved Cottongrass
1	*Eriophorum vaginatum*	Hare's-tail Cottongrass
1	*Eupatorium cannabinum*	Hemp-agrimony
1	*Filipendula ulmaria*	Meadowsweet
1/4	*Frangula alnus*	Alder Buckthorn
1	*Galium palustre*	Common Marsh-bedstraw
1	*Galium uliginosum*	Fen Bedstraw

1	*Geum rivale*	Water Avens
1	*Glyceria declinata*	Small Sweet-grass
1	*Glyceria fluitans*	Floating Sweet-grass
1	*Glyceria maxima*	Reed Sweet-grass
1	*Glyceria notata*	Plicate Sweet-grass
1	*Gnaphalium uliginosum*	Marsh Cudweed
8	*Groenlandia densa*	Opposite-leaved Pondweed
1	*Hesperis matrionalis*	Dame's Violet
2	*Hippuris vulgaris*	Mare's Tail
2	*Hottonia palustris*	Water-violet
8	*Hydrocharis morsus-ranae*	Frogbit
1	*Hydrocotyle vulgaris*	Marsh Pennywort
8	*Hypericum elodes*	Marsh St. John's-wort
1	*Hypericum tetrapterum*	Square-stalked St. John's-wort
1	*Impatiens capensis*	Orange Balsam
1	*Impatiens glandulifera*	Indian Balsam
4	*Impatiens noli-tangere*	Touch-me-not Balsam
1	*Iris pseudacorus*	Yellow Iris
1	*Isolepis setacea*	Bristle Club-rush
1	*Juncus acutiflorus*	Sharp-flowered Rush
1	*Juncus articulatus*	Jointed Rush
1	*Juncus bufonius* agg.	Toad Rush
1	*Juncus bulbosus*	Bulbous Rush
4	*Juncus compressus*	Round-fruited Rush
1	*Juncus conglomeratus*	Compact Rush
1	*Juncus effusus*	Soft-rush
1	*Juncus inflexus*	Hard Rush
8	*Juncus subnodulosus*	Blunt-flowered Rush
1	*Lagarosiphon major*	Curly Waterweed
2	*Lemna gibba*	Fat Duckweed
1	*Lemna minor*	Common Duckweed
1	*Lemna minuta*	Least Duckweed
1	*Lemna trisulca*	Ivy-leaved Duckweed
2	*Littorella uniflora*	Shoreweed
1	*Lotus pedunculatus*	Greater Bird's-foot-trefoil
8	*Luronium natans*	Floating Water-plantain
1	*Lychnis flos-cuculi*	Ragged-Robin
1	*Lycopus europaeus*	Gypsywort

1	*Lysimachia nemorum*	Yellow Pimpernel
1/2	*Lysimachia nummularia*	Creeping-Jenny
1	*Lysimachia vulgaris*	Yellow Loosestrife
2	*Lythrum portula*	Water Purslane
1	*Lythrum salicaria*	Purple-loosestrife
1	*Mentha aquatica*	Water Mint
2	*Menyanthes trifoliata*	Bogbean
1	*Mimulus* spp. or hybrids	Monkeyflower
1	*Molinia caerulea*	Purple Moor-grass
1	*Montia fontana*	Blinks
1	*Myosotis laxa*	Tufted Forget-me-not
1	*Myososis scorpioides*	Water Forget-me-not
2	*Myosotis secunda*	Creeping Forget-me-not
8	*Myosoton aquaticum*	Water Chickweed
4	*Myrica gale*	Bog Myrtle
4	*Myriophyllum alterniflorum*	Alternate Water-milfoil
1	*Myriophyllum aquaticum*	Parrot's Feather
1	*Myriophyllum spicatum*	Spiked Water-milfoil
8	*Myriophyllum verticillatum*	Whorled Water-milfoil
2	*Narthecium ossifragum*	Bog Asphodel
1	*Nuphar lutea*	Yellow Water-lily
1/2	*Nymphaea alba*	White Water-lily
1	*Nymphoides peltata*	Fringed Water-lily
4	*Oenanthe aquatica*	Fine-leaved Water-dropwort
1	*Oenanthe crocata*	Hemlock Water-dropwort
4	*Oenanthe fistulosa*	Tubular Water-dropwort
2	*Oenanthe lachenalii*	Parsley Water-dropwort
1/2	*Osmunda regalis*	Royal Fern
4	*Parnassia palustris*	Grass of Parnassus
8	*Pedicularis palustris*	Marsh Lousewort
1	*Persicaria amphibia*	Amphibious Bistort
1	*Persicaria hydropiper*	Water-pepper
1	*Persicaria lapathifolia*	Pale Persicaria
1	*Persicaria maculosa*	Redshank
8	*Persicaria mitis*	Tasteless Water-pepper
8	*Persicaria minor*	Small Water-pepper
1	*Petasites hybridus*	Butterbur
1	*Phalaris arundinacea*	Reed Canary-grass
1	*Phragmites australis*	Common Reed
8	*Pilularia globulifera*	Pillwort
1	*Pinguicula vulgaris*	Common Butterwort

Individual species scores for the Lancashire Plant Conservation Score

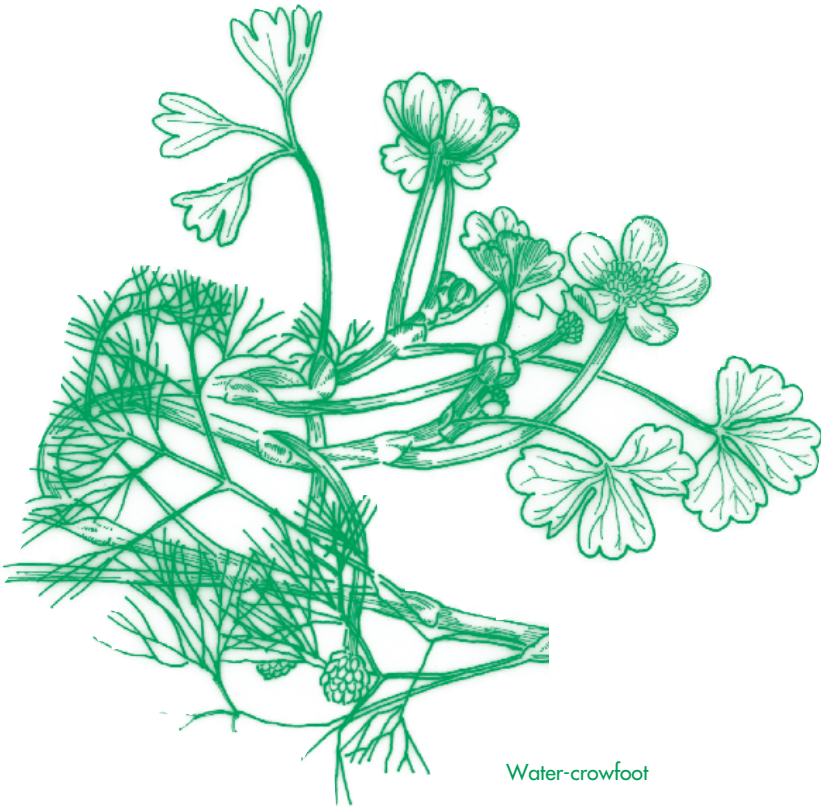
1	*Potentilla erecta*	Tormentil
1	*Potentilla palustris*	Marsh Cinquefoil
4	*Potamogeton alpinus*	Red Pondweed
2	*Potamogeton berchtoldii*	Small Pondweed
8	*Potamogeton coloratus*	Fen Pondweed
8	*Potamogeton compressus*	Grass-wrack Pondweed
2	*Potamogeton crispus*	Curled Pondweed
1	*Potamogeton epihydrus*	American Pondweed
8	*Potamogeton filiformis*	Slender-leaved Pondweed
8	*Potamogeton friesii*	Flat-stalked Pondweed
8	*Potamogeton gramineus*	Various-leaved Pondweed
8	*Potamogeton lucens*	Shining Pondweed
1	*Potamogeton natans*	Broad-leaved Pondweed
2	*Potamogeton obtusifolius*	Blunt-leaved Pondweed
2	*Potamogeton pectinatus*	Fennel Pondweed
2	*Potamogeton perfoliatus*	Perfoliate Pondweed
2	*Potamogeton polygonifolius*	Bog Pondweed
4	*Potamogeton praelongus*	Long-stalked Pondweed
4	*Potamogeton pusillus*	Lesser Pondweed
8	*Potamogeton trichoides*	Hairlike Pondweed
1	*Pulicaria dysenterica*	Common Fleabane
2	*Ranunculus aquatilis sens. str.*	Common Water-crowfoot
4	*Ranunculus baudotii*	Brackish Water-crowfoot
8	*Ranunculus circinatus*	Fan-leaved Water-crowfoot
1	*Ranunculus ficaria*	Lesser Celandine
1	*Ranunculus flammula*	Lesser Spearwort
1	*Ranunculus hederaceus*	Ivy-leaved Crowfoot
1/4	*Ranunculus lingua*	Greater Spearwort
1	*Ranunculus omiophyllus*	Round-leaved Crowfoot
4	*Ranunculus peltatus*	Pond Water-crowfoot
2	*Ranunculus penicillatus*	Stream Water-crowfoot
1	*Ranunculus sceleratus*	Celery-leaved Buttercup
2	*Ranunculus trichophyllus*	Thread-leaved Water-crowfoot
8	*Ranunculus tripartitus*	Three-lobed Crowfoot
1	*Rhinanthus minor*	Yellow-rattle
8	*Rhynchospora alba*	White Beak-sedge
4	*Rorippa amphibia*	Greater Yellow-cress
1	*Rorippa microphylla*	Narrow-fruited Water-cress
1	*Rorippa nasturium-aquaticum*	Water-cress
2	*Rorippa palustris*	Marsh Yellow-cress
2	*Rorippa sylvestris*	Creeping Yellow-cress
1	*Rumex conglomeratus*	Clustered Dock
2	*Rumex hydrolapathum*	Water Dock
8	*Rumex maritimus*	Golden Dock
8	*Rumex palustris*	Marsh Dock

Individual species scores for the Lancashire Plant Conservation Score

1	*Sagina procumbens*	Procumbent Pearlwort
2	*Sagittaria sagittifolia*	Arrowhead
2	*Samolus valerandi*	Brookweed
8	*Schoenoplectus lacustris*	Common Club-rush
2	*Schoenoplectus tabernaemontani*	Grey Club-rush
8	*Schoenus nigricans*	Black Bog-rush
1	*Scrophularia auriculata*	Water Figwort
2	*Scrophularia umbrosa*	Great Figwort
1	*Scutellaria galericulata*	Skullcap
1	*Senecio aquaticus*	Marsh Ragwort
1	*Senecio fluviatilis*	Broad-leaved Ragwort
1	*Solanum dulcamara*	Bittersweet
8	*Sparganium angustifolium*	Floating Bur-reed
1	*Sparganium emersum*	Unbranched Bur-reed
1	*Sparganium erectum*	Branched Bur-reed
8	*Sparganium natans*	Least Bur-reed
4	*Spirodela polyrhiza*	Greater Duckweed
1	*Stachys palustris*	Marsh Woundwort
8	*Stellaria palustris*	Marsh Stitchwort
1	*Stellaria uliginosa*	Bog Stitchwort
1/8	*Stratiotes aloides*	Water-soldier
1	*Symphytum officinale/uplandicum*	Common/Russian Comfrey
2	*Thalictrum flavum*	Common Meadow-rue
8	*Thelypteris palustris*	Marsh Fern
2	*Trichophorum cespitosum*	Deergrass
1	*Triglochin palustris*	Marsh Arrowgrass
2	*Typha angustifolia*	Lesser Bulrush
1	*Typha latifolia*	Bulrush
1	*Vaccinium oxycoccos*	Cranberry
1	*Valeriana dioica*	Marsh Valerian
1	*Vallisneria spiralis*	Tapegrass
2	*Veronica anagallis-aquatica*	Blue Water-speedwell
1	*Veronica beccabunga*	Brooklime
2	*Veronica catenata*	Pink Water-speedwell
2	*Veronica scutellata*	Marsh Speedwell
1	*Viola palustris*	Marsh Violet
8	*Utricularia australis*	Bladderwort
8	*Utricularia intermedia*	Intermediate Bladderwort
8	*Utricularia minor*	Lesser Bladderwort
8	*Utricularia vulgaris*	Greater Bladderwort
8	*Wolffia arrhiza*	Rootless Duckweed
2	*Zannichellia palustris*	Horned Pondweed

TABLE 5. Lancashire Pond Score Diversity Factor (See Guideline Po1)

Lancashire Pond Score Diversity Factor						
Number of Species	Diversity Factor	Number of Species	Diversity Factor	Number of Species	Diversity Factor
5	0.058	20	0.236	35	0.430
6	0.070	21	0.249	36	0.444
7	0.081	22	0.261	37	0.458
8	0.093	23	0.273	38	0.472
9	0.105	24	0.286	39	0.486
10	0.117	25	0.299	40	0.500
11	0.128	26	0.311	41	0.515
12	0.140	27	0.324	42	0.530
13	0.152	28	0.337	43	0.545
14	0.164	29	0.350	44	0.560
15	0.176	30	0.363	45	0.576
16	0.188	31	0.376	46	0.591
17	0.200	32	0.389	47	0.601
18	0.212	33	0.403	48	0.623
19	0.224	34	0.416	49	0.639



Water-crowfoot

6.8 ROCK HABITATS

Ro1 Areas subject to approved Limestone Pavement Orders.

Application

Limestone Pavement Orders are those made under section 34 of the Wildlife and Countryside Act 1981.

Justification

Limestone Pavement Orders protect pavements of special interest by reason of their flora, geological and physiographical features. Limestone pavement is a rare habitat in Britain, Lancashire being one of only six counties in which it occurs. It is a refuge for a number of rare and uncommon wildlife species and is of outstanding scientific interest. It is the most natural of all non-maritime habitats in Lancashire. All significant areas of limestone pavement in Lancashire are now subject to Orders.

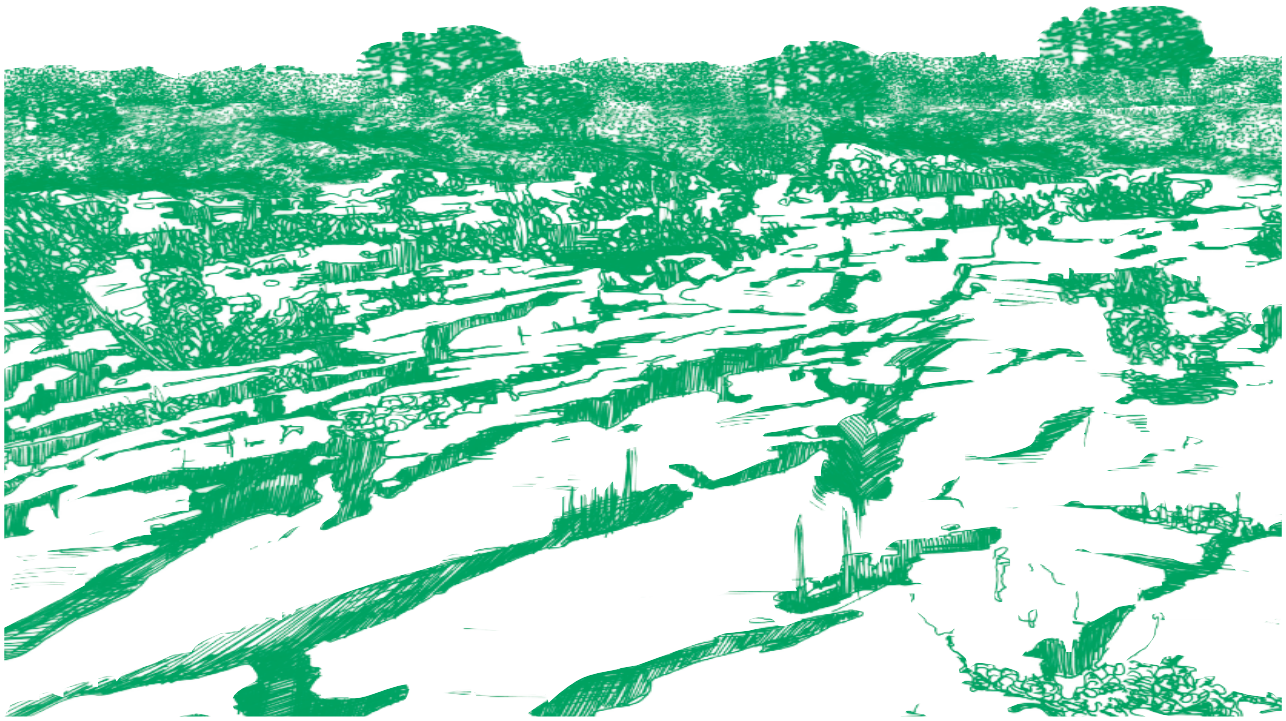
Ro2 Cliffs greater than 5 metres high which are considered to contribute significantly to the biodiversity of the Landscape Zone[1] in which they occur.

Application

This guideline may be applied to shale, sandstone or limestone cliffs, maritime or inland, provided that they are of essentially natural origin.

Justification

Natural rock cliffs are uncommon, although widely scattered, in Lancashire. They may be a significant wildlife refuge, particularly for plant species which are susceptible to grazing and also for mosses, liverworts and lichens which require a suitable rock substrate on which to grow.



(1) See Appendix 1.

6.9 COASTAL HABITATS

Application (all coastal habitat guidelines)

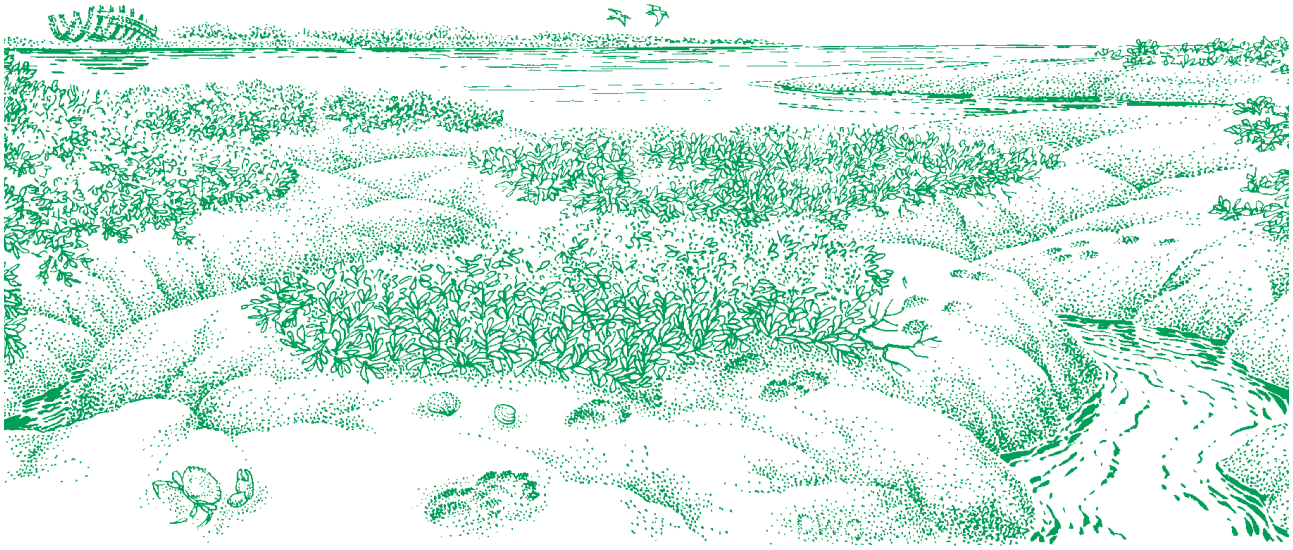
These guidelines apply both to intertidal areas, and also to other semi-natural habitats which are the creation of coastal processes or are otherwise directly affected by the sea. Habitats are defined in NCC (1990).

It should be noted that large parts of the intertidal area and all of the major estuaries in Lancashire are designated Sites of Special Scientific Interest.

Justification (all coastal habitat guidelines)

Lancashire's coast is its single most important wildlife habitat. All significant areas of undeveloped coastal habitat are regarded as being of nature conservation significance, since they either form part of a continuous coastal complex, or else are fragments of habitats which are now rare (like sand dune systems and coastal grasslands) following 19th and 20th century resort development and coastal defence works.

Co1	Area of saltmarsh greater than 0.5 hectare.
Co2	Maritime hard or soft cliffs.
Co3	Sand-dune systems and areas of dune grassland greater than 0.5 hectare.
Co4	Areas of species-rich coastal grassland and associated scrub greater than 0.5 hectare.
Co5	Shingle beaches greater than 0.5 hectare.
Co6	Mudflats greater than 0.5 hectare and greater than 20metres wide.



6.10 ARTIFICIAL HABITATS

Ar1 Sites in the following categories which are considered to contribute significantly to the biodiversity of the Landscape Character Tract[1] in which they occur:

a) Arable land
b) Orchards
c) Hedges
d) Walls
e) Coastal embankments
f) Churchyards
g) Parks and golf courses
h) Canals and ditches
i) Reservoirs and mill lodges
j) Gravel pits
k) Quarries and mines
l) Spoil tips and landfill
m) Derelict and unmanaged land
n) Sewage works

Application

To qualify under this guideline, a site must have biological features which are peculiarly a function of the site's artificial origin and which can be demonstrated to be part of the County's "critical environmental capital". Such sites may contain features or areas within them which satisfy other habitat guidelines. However, the application of this guideline to sites which already satisfy one or more other habitat guidelines simply because the site is in one of the artificial categories listed above should be avoided. No sites have, at present, been identified in some of the categories shown.

Justification

The collective importance for wildlife of small-scale landscape features is now formally recognised, both in the EC Habitats Directive and in government policy as set out in Department of the Environment 1994b.

However, a relatively small number of such features may also be of significant importance in their own right. Ponds are the subject of a separate guideline (Po1).

This guideline also recognises the fact that some sites which are the direct legacy of industrial activity, and frequently do not satisfy other habitat guidelines, can make an important contribution to biodiversity.

Ar2 Roadside verges and railway track-sides (including disused railways) which conform to other guidelines except in terms of minimum size may be considered where they are at least 100 metres in length.

Application

Some sites may also meet one or more species guidelines. Sites which fail to meet guideline Gr3 on grounds other than size, and which meet no other guideline, should be considered only if they can be regarded as part of the County's "critical environmental capital". The majority of sites which have been selected were originally identified as `special verges' in the joint Lancashire Wildlife Trust/LCC Roadside Verge Survey, or were identified from the East Lancashire Line Survey conducted by LWT.

Justification

Old established roadside and railway verges may support types of grassland and grassland species which have largely disappeared from the wider landscapes through which they run - often as a result of agricultural changes in the last 50 years. More recent verges can also develop highly diverse plant communities, including many scarce species, which may be conserved if they are appropriately managed.

(1) See Appendix 1.

6.11 OTHER AREAS OF SEMI-NATURAL HABITAT AND HABITAT MOSAICS

Hm1 Areas of semi-natural habitat greater than 10 hectares in Landscape Zone West[1]

Application

This guideline may be applied to any area supporting semi-natural vegetation within the stated criteria, irrespective of type or origin. Some sites may support a single habitat type, but a combination is more usual. Most such sites are largely of secondary origin, comprising land formerly in agricultural or industrial use.

Justification

Continuous areas of semi-natural vegetation greater than 10 hectares in extent are rare on the coastal plain. In these intensively used landscapes, any such areas are likely to be important reservoirs for wildlife and make a significant contribution to local biodiversity.

Hm2 Areas of semi-natural vegetation greater than 15 hectares in Landscape Character Tracts[1] Ei, Eii, Fi and Fii.

Application

See Hm1.

Justification

Although less so than the coastal plain, the lowland fringe farmland and valley landscapes are, for the most part, subject to intensive agricultural or urban use. Large continuous areas of semi-natural habitat are again an important wildlife refuge.

Hm3 Semi-natural habitat mosaics greater than 10 hectares which contribute significantly to the biodiversity of the Landscape Character Tract[1] in which they occur.

Application

This guideline is most commonly applied to complex mosaics of woodland and grassland, frequently with smaller areas of other habitats, which would not individually qualify for inclusion as Biological Heritage Sites. Such sites are frequently used for grazing stock, but not intensively so: they may be wholly or partially unmanaged and evidence of succession of certain habitats by others as a result may occur. Such sites are most typically to be found amongst the `cloughs' of south and east Lancashire.

Justification

Habitat mosaics as described are an important reservoir for biodiversity, especially in parts of the county where good examples of individual habitat types are particularly scarce. They also have an intrinsic value in the variety of habitats, and transitions between habitats, that they contain. These provide important and additional niches for species which depend on more than one habitat during their daily routine, like bats and some birds, or depend on different habitats at different stages in their life cycles, such as amphibians and various invertebrates.

Short-eared Owl

(1) See Appendix 1.

7. Section 2: Species Guidelines

Application (all species guidelines)

In most cases, each species guideline is followed by a list of species to which that guideline applies in Lancashire. Such lists generally include only those species which are known or believed at the time of writing to be extant in the County. For some of the less well-recorded groups of plants and animals these lists include species which were last recorded in Lancashire some time ago, but which may still be present. In some cases, however, species which are likely to have become extinct in recent years are included too, as are a few species which are in the process of extending their established geographical ranges to include Lancashire. Records of species new to the County or of species previously considered extinct which are not included in the lists will also be eligible if they satisfy the terms of the guideline concerned. Hybrids have only been included within the lists where one or both parents are extinct or rare within the County. Wherever possible, English names have been given for the species listed in these guidelines, except for non-vascular plants, where very few species have modern English names. For the sake of clarity, scientific names are also given for each group, except for birds which are generally known by their English names.

For the purposes of these guidelines, a `locality' is defined as an area not exceeding one square kilometre in extent comprising either a movable 1km x 1km square (not necessarily corresponding to a national grid square), a unit of corresponding area or a single continuous habitat. General guidance on the application of all species guidelines is also given in paragraphs 3.11 to 3.16 of the Introduction.

It is important to note that Biological Heritage Sites should normally be identified only on the basis of reliable field records made within a period of not more than five years prior to the time of first assessment. For the purposes of the first systematic identification of sites throughout Lancashire, records should be post-1987 (except where otherwise stated), but this date should be adjusted for future assessments (see paragraph 4.8 to 4.10). It should also be borne in mind that monitoring of sites for the presence of particular species can take place only as often as resources allow.

Use of the term `regularly' in those guidelines relating to animal species means that the species should be recorded from the site concerned for a minimum of 3

Green - winged Orchid

separate years (not necessarily consecutive) since 1987, unless otherwise stated. In some cases, sites may be designated on the basis of less regular evidence, where there are reasonable grounds to assume that the species concerned is still present or continues to use the site in question (but see also paragraph 4.8 of Introduction).

The internationally accepted system for the preparation of "Red Data Books" has recently changed. Reference in these guidelines to species included in Red Data Books or Red Data Lists means, firstly, all relevant species included in those Red Data Books published for species groups before 1997 and, secondly, those species categorised as Critically Endangered, Endangered, Vulnerable, Near Threatened or Data Deficient in Red Data Books or Lists compiled according to the revised IUCN Red List system (World Conservation Union 1994), except where Data Deficient species are subsequently shown to occur in more than 15 10km squares in the UK.

7.1 FLOWERING PLANTS AND FERNS

Application (all flowering plant and fern guidelines)

These guidelines relate to species occurring naturally in Lancashire as defined in paragraph 3.12 of the Introduction. Scientific and common names of flowering plants and ferns are from Stace 2nd Ed (1997).

Ff1 Any site which supports a population of a species listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) or in *British Red Data Books: Vascular Plants*[1].

Application

Any site with a population of a plant in the above categories should be included, except for those which are the result of recent deliberate introductions (which do not form part of a species recovery programme) or localities where a species occurs as a short-term casual. Relevant species recorded for Lancashire include:

Alchemilla acutiloba	Lady's-mantle
Alchemilla glaucescens	Lady's-mantle
Calamagrostis stricta	Narrow Small-reed
Cypripedium calceolus	Lady's-slipper
Eleocharis austriaca	Northern Spike-rush
Limonium britannicum ssp. *celticum*	Rock Sea-lavender
Sorbus lancastriensis	Lancaster Whitebeam

Justification

The species in the above categories are either threatened or rare in Western Europe or Britain and for which there is either an international or national responsibility for their conservation.

Ff2 Any site which supports a native population of a species identified as "scarce" in *Scarce Plants in Britain.*[2]

Application

All sites with a population of a plant in the above category (Stewart *et al.* 1994) should be included, except for those which are the result of recent deliberate introductions (which do not form part of a species recovery programme) or localities where a species occurs as a short-term casual. However, the presence of blue moor-grass *Sesleria caerulea* in Landscape Character Tract D - Silverdale[3] does not, of itself, qualify a site for inclusion. Relevant species recorded for Lancashire include:

Actaea spicata	Baneberry
Atriplex longipes	Long-stalked Orache
Brassica oleracea	Wild Cabbage
Bromopsis benekenii	Lesser Hairy-brome
Cardamine impatiens	Narrow-leaved Bitter-cress
Carex digitata	Fingered Sedge
Carex ericetorum	Rare Spring-sedge
Centaurium littorale	Seaside Centaury
Coincya monensis ssp. *monensis*	Isle-of-Man Cabbage
Crepis mollis	Northern Hawk's-beard
Daphne mezereum	Mezereon
Dryopteris submontana	Rigid Buckler-fern
Epipactis atrorubens	Dark-red Helleborine
Epipactis leptochila (including var. *dunensis)*	Narrow-lipped Helleborine (Dune Helleborine)
Epipactis phyllanthes	Green-flowered Helleborine
Equisetum variegatum	Variegated Horsetail
Euphorbia portlandica	Portland Spurge
Euphrasia rostkoviana ssp. *rostkoviana*	Eyebright
Fumaria purpurea	Purple Ramping-fumitory
Galeopsis angustifolia	Red Hemp-nettle
Gymnocarpium robertianum	Limestone Fern
Helleborus foetidus	Stinking Hellebore
Hordelymus europaeus	Wood Barley
Impatiens noli-tangere	Touch-me-not Balsam
Juncus filiformis	Thread Rush

(1) Wigginton (in prep.)
(2) Stewart *et al* (1994)
(3) See Appendix 1.

Lepidium latifolium	Dittander
Limonium humile	Lax-flowered Sea-lavender
Limosella aquatica	Mudwort
Minuartia verna	Spring Sandwort
Myosotis stolonifera	Pale Forget-me-not
Myriophyllum verticillatum	Whorled Water-milfoil
Persicaria mitis	Tasteless Water-pepper
Polygonatum odoratum	Angular Solomon's-seal
Potamogeton coloratus	Fen Pondweed
Potamogeton trichoides	Hairlike Pondweed
Potentilla neumanniana	Spring Cinquefoil
Primula farinosa	Bird's-eye Primrose
Pyrola rotundifolia ssp. *maritima*	Round-leaved Wintergreen
Ribes spicatum	Downy Currant
Sesleria caerulea	Blue Moor-grass
Sorbus rupicola	Rock Whitebeam
Stratiotes aloides	Water-soldier
Vulpia fasciculata	Dune Fescue

Justification

The species in the above categories are scarce nationally, occurring in more than 16 but less than and including 100 10km squares in Britain, and there is a national responsibility for their conservation. Blue moor-grass *Sesleria caerulea* is scarce or absent in all parts of Lancashire with the exception of Landscape Character Tract D[(1)] where the species is abundant, even on roadside verges, and is not there considered under any overall threat. The most significant sites for this species within Landscape Character Tract D will be covered by other guidelines, eg. Grassland Gr1 and Rock Habitats Ro1.

Sea Bindweed

Ff3

Any site which supports a population of a species categorized as "Endangered" in *Provisional Lancashire Red Data List of Vascular Plants.*

Application

All sites with a population of a plant in the above category (Lancashire County Council in prep.) not covered by Guidelines Ff1 or Ff2, should be included, except for those populations which are the result of recent deliberate introductions (which do not form part of a species recovery programme) or localities where a species occurs as a short-term casual. A list of relevant species includes:

Alchemilla filicaulis ssp. *filicaulis*	Lady's-mantle
Allium oleraceum	Field Garlic
Alopecurus aequalis	Orange Foxtail
Anacamptis pyramidalis	Pyramidal Orchid
Anagallis minima	Chaffweed
Asperula cynanchica	Squinancywort
Asplenium marinum	Sea Spleenwort
Asplenium viride	Green Spleenwort
Blysmus compressus	Flat-sedge
Bromopsis erecta	Upright Brome
Calamagrostis canescens	Purple Small-reed
Callitriche brutia	Pedunculate Water-starwort
Calystegia soldanella	Sea Bindweed
Campanula trachelium	Nettle-leaved Bellflower
Carex bigelowii	Stiff Sedge
Carex diandra	Lesser Tussock-sedge
Carex lasiocarpa	Slender Sedge
Carex riparia	Greater Pond-sedge
Carex strigosa	Thin-spiked Wood-sedge
Carex viridula ssp. *viridula*	Yellow-sedge
Carum verticillatum	Whorled Caraway
Catabrosa aquatica	Whorl-grass
Ceologlossum viride	Frog Orchid
Cerastium arvense	Field Mouse-ear
Ceratophyllum submersum	Soft Hornwort
Cirsium acaule	Dwarf Thistle
Cladium mariscus	Great Fen-sedge
Cornus suecica	Dwarf Cornel
Crepis biennis	Rough Hawk's-beard
Crithmum maritimum	Rock Samphire
Cryptogramma crispa	Parsley Fern
Cynoglossum officinale	Hound's-tongue
Draba incana	Hoary Whitlowgrass
Dryopteris aemula	Hay-scented Buckler-fern
Dryopteris oreades	Mountain Male-fern

(1) See Appendix 1.

Eleocharis multicaulis	Many-stalked Spike-rush
Epilobium alsinifolium	Chickweed Willowherb
Eriophorum latifolium	Broad-leaved Cottongrass
Erodium lebelii	Sticky Stork's-bill
Euphorbia paralias	Sea Spurge
Euphrasia anglica	Eyebright
Euphrasia micrantha	Eyebright
Filago minima	Small Cudweed
Filago vulgaris	Common Cudweed
Gagea lutea	Yellow Star-of-Bethlehem
Galium boreale	Northern Bedstraw
Gentianella campestris	Field Gentian
Gnaphalium sylvaticum	Heath Cudweed
Groenlandia densa	Opposite-leaved Pondweed
Hordeum secalinum	Meadow Barley
Hydrocharis morsus-ranae	Frogbit
Hymenophyllum wilsonii	Wilson's Filmy-fern
Juncus balticus x J. inflexus	a hybrid rush
Ledum palustre	Labrador-tea
Listera cordata	Lesser Twayblade
Lotus glaber	Narrow-leaved Bird's-foot-trefoil
Monotropa hypopitys	Yellow Bird's-nest
Neottia nidus-avis	Bird's-nest Orchid
Nepeta cataria	Cat-mint
Orchis morio	Green-winged Orchid
Parentucellia viscosa	Yellow Bartsia
Pedicularis palustris	Marsh Lousewort
Persicaria minorSmall	Water-pepper
Platanthera bifoliaLesser	Butterfly-orchid
Platanthera chlorantha	Greater Butterfly-orchid
Populus nigra ssp. *betulifolia*	Black-poplar
Potamogeton x lintonii	Linton's Pondweed
Potamogeton lucens	Shining Pondweed
Potentilla argentea	Hoary Cinquefoil
Puccinellia distans	Reflexed Saltmarsh-grass
Ranunculus circinatus	Fan-leaved Water-crowfoot
Ranunculus peltatus	Pond Water-crowfoot
Rhynchospora alba	White Beak-sedge
Rosa obtusifolia	Round-leaved Dog-rose
Rumex longifolius	Northern Dock
Rumex maritimus	Golden Dock
Salix myrsinifolia	Dark-leaved Willow
Salix phylicifolia	Tea-leaved Willow
Schoenoplectus lacustris	Common Club-rush
Schoenus nigricans	Black Bog-rush
Scutellaria minor	Lesser Skullcap
Silaum silaus	Pepper-saxifrage
Sorbus torminalis	Service-tree
Sparganium natans	Least Bur-reed
Spiranthes spiralis	Autumn Lady's-tresses
Torilis nodosa	Knotted Hedge-parsley
Trientalis europaea	Chickweed Wintergreen
Utricularia spp.	Bladderwort (any species)
Verbena officinalis	Vervain
Vicia lathyroides	Spring Vetch
Viola tricolor ssp. *curtisii*	Wild Pansy
Wahlenbergia hederacea	Ivy-leaved Bellflower

Justification

Species covered by this guideline are recorded from 3 or fewer localities in Lancashire and/or are considered at risk of extinction in a County context. The conservation of all sites supporting such species is seen as important in maintaining the biological diversity of Lancashire.

Ff4 (a)

Any site which supports a population of a species categorized as "Vulnerable" in *Provisional Lancashire Red Data List of Vascular Plants* where such populations contribute significantly to the distribution pattern, or the total population size, of that species in the County.

Application

Any site with a population of a plant in the above category (Lancashire County Council in prep.) not covered by Guidelines Ff1 or Ff2 may be considered for inclusion, where it significantly extends the geographical range of the species in Lancashire, or supports a significant proportion of the estimated total County population of that species. Populations which are the result of recent deliberate introductions, or localities where a species occurs as a short-term casual, should not be included. A list of relevant species includes:

Agrimonia procera	Fragrant Agrimony
Alisma lanceolatum	Narrow Water-plantain
Andromeda polifolia	Bog Rosemary
Aphanes australis	Slender Parsley-piert
Apium inundatum	Lesser Marshwort
Aquilegia vulgaris	Columbine
Atriplex laciniata	Frosted Orache
Atropa belladonna	Deadly Nightshade

Baldellia ranunculoides	Lesser Water-plantain
Blackstonia perfoliata	Yellow-wort
Botrychium lunaria	Moonwort
Callitriche obtusangula	Blunt-fruited Water-starwort
Carex acuta	Slender Tufted-sedge
Carex elata	Tufted-sedge
Carex muricata ssp. *lamprocarpa*	Prickly Sedge
Carex vesicaria	Bladder-sedge
Centaurium pulchellum	Lesser Centaury
Clinopodium acinos	Basil Thyme
Convallaria majalis	Lily-of-the-valley
Crambe maritima	Sea-kale
Daphne laureola	Spurge-laurel
Eleocharis quinqueflora	Few-flowered Spike-rush
Epipactis palustris	Marsh Helleborine
Equisetum hyemale	Rough Horsetail
Erophila glabrescens	Glabrous Whitlowgrass
Eryngium maritimum	Sea-holly
Euphorbia exigua	Dwarf Spurge
Euphrasia arctica ssp. *borealis*	Eyebright
Euphrasia scottica	Eyebright
Euphrasia tetraquetra	Eyebright
Festuca filiformis	Fine-leaved Sheep's-fescue
Frangula alnus	Alder Buckthorn
Fumaria bastardii	Tall Ramping-fumitory
Fumaria capreolata	White Ramping-fumitory
Genista anglica	Petty Whin
Geranium columbinum	Long-stalked Crane's-bill
Geranium pusillum	Small-flowered Crane's-bill
Geranium sanguineum	Bloody Crane's-bill
Geranium sylvaticum	Wood Crane's-bill
Glaucium flavum	Yellow Horned-poppy
Helleborus viridis	Green Hellebore
Hippocrepis comosa	Horseshoe Vetch
Huperzia selago	Fir Clubmoss
Hypericum montanum	Pale St.John's-wort
Jasione montana	Sheep's-bit
Juncus compressus	Round-fruited Rush
Juncus subnodulosus	Blunt-flowered Rush
Lithospermum officinale	Common Gromwell
Lycopodium clavatum	Stag's-horn Clubmoss
Melica nutans	Mountain Melick
Myosotis ramosissima	Early Forget-me-not
Myrica gale	Bog-myrtle
Myriophyllum alterniflorum	Alternate Water-milfoil
Oenanthe aquatica	Fine-leaved Water-dropwort
Oenanthe fistulosa	Tubular Water-dropwort
Ononis spinosa	Spiny Restharrow
Ophrys insectifera	Fly Orchid
Ornithopus perpusillus	Bird's-foot
Orobanche minor	Common Broomrape
Parnassia palustris	Grass-of-Parnassus
Phleum arenarium	Sand Cat's-tail
Picris echioides	Bristly Oxtongue
Polygonum oxyspermum ssp. *raii*	Ray's Knotgrass
Polypodium cambricum	Southern Polypody
Potamogeton alpinus	Red Pondweed
Potamogeton pusillus	Lesser Pondweed
Ranunculus baudotii	Brackish Water-crowfoot
Ranunculus sardous	Hairy Buttercup
Rhinanthus minor ssp. *stenophyllusa*	Yellow-rattle
Rosa tomentosa	Harsh Downy-rose
Rubus chamaemorus	Cloudberry
Rubus saxatilis	Stone Bramble
Ruppia maritima	Beaked Tasselweed
Salsola kali	Prickly Saltwort
Saxifraga hypnoides	Mossy Saxifrage
Selaginella selaginoides	Lesser Clubmoss
Seriphidium maritimum	Sea Wormwood
Spirodela polyrhiza	Greater Duckweed
Trifolium striatum	Knotted Clover
Viola canina	Heath Dog-violet

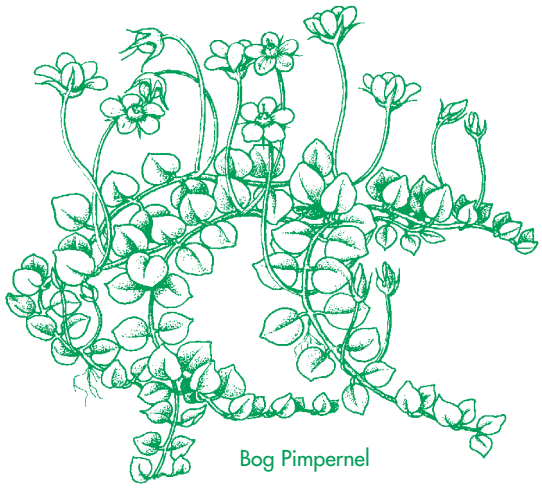
Justification

Species included here are recorded from 4 or more localities in Lancashire, and whilst not in immediate danger of extinction in the County, are nonetheless considered to be at risk and could fall into the endangered category without adequate preventative measures.

Marsh Helleborine

Ff4 (b)

Any site which supports a population of a species categorized as "Sensitive" in *Provisional Lancashire Red Data List of Vascular Plants* where such populations contribute exceptionally to the distribution pattern, or the total population size of that species in the County.



Bog Pimpernel

Application

Any site with a population of a plant species in the above category (Lancashire County Council in prep.) not covered by Guidelines Ff1 or Ff2 may be considered for inclusion, where the population concerned is either isolated geographically or represents an exceptionally high proportion of the total Lancashire population of that species. Populations which are the result of recent deliberate introductions, or localities where a species occurs as a short-term casual, should not be included. A list of relevant species includes:

Allium scorodoprasum	Sand Leek
Anagallis tenella	Bog Pimpernel
Apium graveolens	Wild Celery
Arenaria serpyllifolia ssp. *leptoclados*	Slender Sandwort
Atriplex glabriuscula	Babington's Orache
Atriplex littoralis	Grass-leaved Orache
Berberis vulgaris	Barberry
Blysmus rufus	Saltmarsh Flat-sedge
Callitriche hermaphroditica	Autumnal Water-starwort
Carduus tenuiflorus	Slender Thistle
Carex dioica	Dioecious Sedge
Carex extensa	Long-bracted Sedge
Carex hostiana	Tawny Sedge
Carex spicata	Spiked Sedge
Carex viridula ssp. *brachyrrhyncha*	Yellow-sedge
Catapodium marinum	Sea Fern-grass
Centaurea scabiosa	Greater Knapweed
Cerastium semidecandrum	Little Mouse-ear
Cirsium heterophyllum	Melancholy Thistle
Clematis vitalba	Traveller's-joy
Cochlearia pyrenaica	Pyrenean Scurvygrass
Crocus nudiflorus	Autumn Crocus
Dactylorhiza maculata	Heath Spotted-orchid
Dactylorhiza purpurella	Northern Marsh-orchid
Eleocharis uniglumis	Slender Spike-rush
Euonymus europaeus	Spindle
Festuca altissima	Wood Fescue
Filipendula vulgaris	Dropwort
Galium sterneri	Limestone Bedstraw
Gymnadenia conopsea	Fragrant Orchid
Hippurus vulgaris	Mare's-tail
Hottonia palustris	Water-violet
Hypericum androsaemum	Tutsan
Hypericum x desetangsii	Des Etangs' *St.* John's-wort
Hypericum humifusum	Trailing St. John's-wort
Hypericum maculatum	Imperforate St. John's-wort
Inula conyza	Ploughman's-spikenard
Juncus ambiguus	Frog Rush
Juniperus communis	Common Juniper
Lamiastrum galeobdolon	Yellow Archangel
Lathraea squamaria	Toothwort
Limonium vulgare	Common Sea-lavender
Lythrum portula	Water-purslane
Menyanthes trifoliata	Bogbean
Narcissus pseudonarcissus	Wild Daffodil
Nymphaea alba	White Water-lily
Ophrys apifera	Bee Orchid
Osmunda regalis	Royal Fern
Paris quadrifolia	Herb Paris
Polygonatum multiflorum	Solomon's-seal
Polypodium interjectum	Intermediate Polypody
Polstichum setiferum	Soft Shield-fern
Ranunculus lingua	Greater Spearwort
Ranunculus penicillatus	Stream Water-crowfoot
Ranunculus trichophyllus	Thread-leaved Water-crowfoot
Rosa pimpinellifolia	Burnet Rose
Rosa rubiginosa	Sweet-briar
Rumex hydrolapathus	Water Dock

Salix triandra	Almond Willow
Samolus valerandi	Brookweed
Scirpus sylvaticus	Wood Club-rush
Scleranthus annuus	Annual Knawel
Scrophularia umbrosa	Green Figwort
Sedum telephium	Orpine
Serratula tinctoria	Saw-wort
Stellaria neglecta	Greater Chickweed
Stellaria pallida	Lesser Chickweed
Symphytum tuberosum	Tuberous Comfrey
Thalictrum flavum	Common Meadow-rue
Tilia cordata	Small-leaved Lime
Trifolium fragiferum	Strawberry Clover
Trifolium micranthum	Slender Trefoil
Trollius europaeus	Globeflower
Vaccinium vitis-idaea	Cowberry
Valerianella lacusta	Common Cornsalad
Veronica scutellata	Marsh Speedwell
Viola hirta	Hairy Violet
Viola riechenbachiana	Early Dog-violet
Zannichellia palustris	Horned Pondweed

Justification

Species included here are generally recorded from 10 or more localities in Lancashire, but have very restricted geographical distributions in the County, small total populations, have shown recent rapid decline in abundance or whose habitats are especially vulnerable to loss or change.

Wood Crane's-bill

7.2 NON-VASCULAR PLANTS

Application (all non-vascular plant guidelines)

Non-vascular plants include lichens, mosses and liverworts, and algae. Their distribution in Lancashire is less well-known than that of flowering plants and ferns, and the species lists given below should be regarded as tentative. These lists include species recorded in Lancashire since 1950, those species not recorded since 1977 being shown with an asterisk. Only sites from which relevant records have been made since 1987 should usually be considered for designation as Biological Heritage Sites. However, consideration may be given (except where otherwise stated) to sites where records have been made between 1978 and 1986 where no gross habitat changes are evident that are likely to have affected the species concerned. Records made between 1950 and 1977 are considered to require confirmation and sites which qualify only on the basis of such records should be identified as provisional entries only. Several of the following guidelines are based on those in *Guidelines for the selection of biological Sites of Special Scientific Interest: non-vascular plants* (Hodgetts 1992), and on information on the national and international status of species supplied by Hodgetts (pers. comm.) and given in Church *et al.* (1997) and in Ing (1995).

Justification (all non-vascular plant guidelines)

Although often inconspicuous and under-recorded, the non-vascular flora of Britain is one of the richest in Europe. Of particular importance are those lichens, mosses and liverworts which require relatively mild wet conditions which occur in western Britain. Although Lancashire's non-vascular plants have suffered from the effects of development, and atmospheric pollution in particular, many species of national as well as local importance remain.

i) LICHENS

Application (all lichen guidelines)

Some lichen species may have very restricted distributions at the local level, being confined, for example, to a single isolated tree in a given locality. In such cases the `site' supporting them may be quite small. In other cases, however, there is a reasonable possibility of such a lichen species spreading more

widely within a larger area which offers appropriate habitat opportunities e.g. an area of woodland or willow scrub, and this, too, should be reflected in the site boundary adopted. Some lichens grow on man-made stone or metal structures, and consideration may be given to the inclusion of gravestones, quarries etc. Scientific names of lichens follow Purvis *et al.* (1992); detailed species information was supplied by Seaward (pers. comm.) and Gosling (pers. comm.).

Li1 (a) Any site which supports a population of a lichen species listed in Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) or in *Red Data Books of Britain and Ireland: Lichens. Volume 1: Britain*[1].

Application

All sites for lichens in the above categories should be included, although no Schedule 8 species have so far been recorded from Lancashire. Pending publication of the Red Data Book, a list of nationally rare species has been supplied by Hodgetts (pers. comm.). A tentative list of species included in Church *et al.* (1997) so far recorded in Lancashire includes:

Lecidea promixta
Leptogium diffractum
Leptogium massiliense

Justification

The species in the above categories are either threatened or rare in Western Europe or Britain and for which there is either an international or national responsibility for their conservation.

Li1 (b) Any site which supports a population of a lichen species threatened in Europe which is also `nationally scarce'.

Application

All sites for lichens in the above category should be included. All `nationally scarce' lichen species are listed by Hodgetts (pers. comm.). Species which are threatened in Europe have also been listed by Hodgetts (pers. comm.), based on Serusiaux (1989).

There are no recent records from Lancashire for species in this category.

Justification

Britain is particularly rich in lichens because of its geographical position in the path of the North Atlantic Drift. Many lichen species which are rare in a European context are not nationally rare in Britain (see Guideline Li1(a)). Some of them are however `nationally scarce', being recorded in only 16 to 100 10km squares (inclusive) in Britain. There is an international responsibility to conserve populations of these species.

Li1 (c) Any site which supports a population of a lichen species threatened in Europe, but neither in *Red Data Books of Britain and Ireland: Lichens. Volume 1: Britain*[1] nor `nationally scarce', where such populations contribute significantly to the distribution pattern, or the total population size, of that species in Lancashire.

Application

Sites which support lichens in the above category may be considered for inclusion where they significantly extend the geographical range of the species in Lancashire or support a significant proportion of the estimated total County population. All `nationally scarce' lichen species (see Li1(b)) are listed by Hodgetts (pers. comm.). Species which are threatened in Europe have also been listed by Church *et al.* (1997), based on Serusiaux (1989). Species so far recorded in Lancashire which are threatened in Europe but not listed in the Red Data Book or nationally scarce include:

Cladonia luteoalba

Lobaria virens

Justification

Britain has an international responsibility to conserve the most important populations of these species. See also Guideline Li1(b).

(1) Church *et al* (1997).

Li2 Any site which supports a population of a `nationally scarce' lichen species not covered by guideline Li1(b).

Application

All sites for lichen species in this category (as listed by Hodgetts (pers. comm.)) should be included. A tentative list of relevant species so far recorded in Lancashire includes:

Arthonia arthonioides

Collema polycarpon

Enterographa hutchinsiae

Fuscidea praeruptarum
Ionaspis epulotica var. *epulotica*

Micarea adnata

Peltigera leucophlebia
Placynthium subradiatum
Porina borreri
Porpidia glaucophaea
Porpidia hydrophila

Rhizocarpon subgeminatum

Strangospora moriformis

Thelidium papulare
Thelidium zwackhii
Toninia lobulata

Umbilicaria deusta

Verrucaria bryoctona

Justification

`Nationally scarce' species occur in 16 to 100 10km squares (inclusive) in Britain; there is a national responsibility for their conservation.

Li3 Any site which supports a population of a lichen species recorded from 3 or fewer localities in Lancashire.

Application

All sites for lichens in the above category which are not included under Guidelines Li1 or Li2 should be considered. The following list of species so far recorded at 3 or fewer localities in Lancashire should be regarded as a guide only since it may include species which are under-recorded:

Agonimia allobata
Anaptychia runcinata
Arthonia lapidicola
Arthonia vinosa

Bacidia arceutina
Bacidia caligans
Bacidia delicata
Bacidia phacodes
Bacidia rubella
Baeomyces placophyllus
Buellia griseovirens
Buellia pulverea

Caloplaca britannica
Caloplaca microthallina
Caloplaca obscurella
Caloplaca ulcerosa
Cetraria islandica
Cladonia arbuscula
Cladonia cervicornis
Cladonia foliacea
Cladonia gracilis
Clauzadea metzleri
Collema flaccidum
Cystocoleus ebeneus

Dermatocarpon luridum
Diploschistes muscorum

Epigloea soleiformis

Foraminella hyperopta
Fuscidea austera

Gyalecta truncigena

Hyperphyscia adglutinata

Inshanyia aleurites

Lasallia pustulata
Lecania aipospila
Lecanora actophila
Lecanora agardhiana
Lecanora carpinea
Lecanora gangaleoides
Lecanora intumescens
Lecanora pulicaris
Lecanora saligna
Lecanora varia
Lecidea ahlesii
Lecidea hypnorum
Lepraria lesdainii
Leproloma vouauxii
Leptogium biatorinum
Leptogium teretiusculum
Leptogium turgidum
Lichina confinis
* *Lobaria pulmonaria*

Macentina stigonemoides

* last recorded 1950 - 1977

Micarea erratica
Micarea leprosula
Micarea peliocarpa
Micarea pycnidiophora
Micarea sylvicola
Miriquidica leucophaea

Normandina pulchella

Ochrolechia tartarea
Omphalina hudsoniana
Opegrapha dolomitica
Opegrapha mougeotii
Opegrapha varia
Opegrapha vermicillifera
Ophioparma ventosum

Parmelia discordans
Parmelia elegantula
Parmelia laevigata
Parmelia tiliacea
Peltigera horizontalis
Pertusaria lactea
Pertusaria pupillaris
Physcia tribacia
Physconia distorta
Polyblastia albida
Polyblastia cupularis
Polyblastia deminuta
Porina leptalea
Pyrenocollema halodytes

Ramalina fastigiata
Ramalina fraxinea
Ramalina siliquosa
Ramalina subfarinacea
Rhizocarpon concentricum
Rhizocarpon geminatum
Rinodina bischoffii
Rinodina orculariopsis

Sarcosagium campestre
Schismatomma decolorans
Scoliciosporum pruinosum
Solenopsora vulturiensis
Staurothele fissa
Staurothele rupifraga

Thelidium incavatum
Thrombium thelostomum
Tremolecia atrata

Umbilicaria torrefacta

Verrucaria aethiobola
Verrucaria fusconigrescens
Verrucaria halizoa
Verrucaria margacea
Verrucaria praetermissa
Vezdaea retigera

Xanthoria elegans

Justification

This list includes some species which may be common elsewhere in Britain, but are rare in Lancashire mainly because of past industrial pollution although it is likely that a number are under-recorded. Small relict populations of such species survive only in those parts of the County which were remote from centres of pollution. Subject to further localities for these species being found, they may provisionally be regarded as `endangered' in a County context. Other species which qualify for inclusion in this list will come to light with further surveys.

Li4 **Any site which supports a significant proportion of the Lancashire population, or contributes significantly to the range in Lancashire, of a lichen species which is recorded from more than 3 localities in the County, but which could be at risk because of very small populations, recent rapid decline, or habitat loss or change.**

Application

Sites for lichen species in the above categories which are not included under Guidelines Li1 or Li2 may be considered for inclusion where they significantly extend the geographical range of the species in Lancashire, or support a significant proportion of the known total County population of that species. It is considered that the systematic recent recording of lichens in Lancashire is insufficiently advanced to allow any reasonably complete listing of species to be produced for this guideline.

Justification

Species included here, whilst not in immediate danger of extinction in the County may, nevertheless, be at risk and could fall into the `endangered' category (see Li3: Justification) without adequate preventative measures.

Li5 Any site with a New Index of Ecological Continuity equal to or greater than 13.

Application

The New Index of Ecological Continuity (NIEC) should be used in ancient woodland and parkland sites. It is calculated by summing the number of lichen species present, from a total of 70 eligible species listed in Hodgetts (1992). For guidance purposes, the eligible species which have been recorded in Lancashire include:

Arthonia vinosa
Arthopyrenia ranunculospora

Cladonia caespiticia
Cladonia parasitica
Collema furfuraceum

Leptogium lichenoides
Leptogium teretiusculum
Lobaria amplissima
Lobaria pulmonaria
Lobaria virens
Loxospora elatine

Micarea pycnidiophora

Nephroma parile

Opegrapha corticola

Peltigera horizontalis
Pertusaria multipuncta

Stenocybe septata
Sticta sylvatica

Thelotrema lepadinum

This list may include species for which there are no recent records.

Justification

A number of Indices of Ecological Continuity (Rose, 1992) have been developed to identify ancient woodland and parkland sites which are potentially rich in epiphytic lichens by the use of a list of indicator species, the presence of which is believed to signify ecological continuity in the past. The New Index of Ecological Continuity is applicable in Lancashire. The qualifying score of 13 is calculated on the basis of the number of qualifying species which occur in Lancashire.

Li6 Any site in Landscape Zones West and South[1] which supports six of the following lichen species:

Application

All sites with six or more of the following species recorded since 1987 should be included:

Dimerella pineti

Lecidella elaeochroma

Parmelia caperata
Parmelia perlata
Parmelia revoluta
Physcia aipolia

Ramalina farinacea
Rinodina exigua

Usnea subfloridana

Justification

Lancashire's lichen flora has been greatly impoverished due, in large part, to past atmospheric pollution. In particular, most lichens are very sensitive to elevated sulphur dioxide levels. The species listed above are moderately pollution-sensitive; their recolonization of sites close to urban areas is proceeding as atmospheric pollution loads decline. It can take many years for lichen recolonization to take place and it is important to protect the best examples of recolonizing sites to act as nuclei for their continued spread to other areas of the County.

ii) MOSSES AND LIVERWORTS (BRYOPHYTES)

Application (all bryophyte guidelines)

Rare Bryophytes in Lancashire (Wigginton 1990) lists those records of rare species made since 1950. The later publication *Mosses and Liverworts of North Lancashire* (Wigginton 1995) builds upon the earlier publication with survey data spanning the period 1978-1995. Scientific names used for bryophytes follow Corley *et al.* (1981) with updates by Corley and Crundwell (1991), together with recent modifications, for mosses; Grolle (1983), with recent modifications, for liverworts.

Justification (all bryophyte guidelines)

Recording of bryophytes in Lancashire since 1978 has concentrated in that part of the County likely to support the large majority of the scarcer species. The

(1) See Appendix 1.

species lists for these guidelines, whilst not definitive, should include most of the relevant species.

Br1 (a) Any site which supports a population of a bryophyte species listed in Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) or in the *Red Data Books of Britain and Ireland: Mosses and Liverworts*[1].

Application

All sites for bryophytes in the above categories should be included, although no Schedule 8 species have so far been recorded from Lancashire. Pending publication of the Red Data Book, a list of nationally rare species has been supplied by Hodgetts (pers. comm.). A provisional list of species recorded in Lancashire since 1950 includes:

MOSSES

* *Ephemerum sessile*

Habrodon perpusillus

Myrinia pulvinata

* *Physcomitrium sphaericum*

Rhytidiadelphus subpinnatus

* *Weissia rostellata*

LIVERWORTS

no species recorded

Justification

The species in the above categories are either threatened or rare in Western Europe or Britain and for which there is either an international or national responsibility for their conservation. Nationally rare species are generally those which are recorded from 15 or fewer 10km squares in Britain.

Br1 (b) Any site which supports a population of a bryophyte species threatened in Europe which is also `nationally scarce'.

Application

All sites for bryophytes in the above category should be included. All `nationally scarce' bryophyte species are listed by Hodgetts (pers. comm.). Species which are threatened in Europe have also been listed by Hodgetts (pers. comm.), based on Schumacker (1990). A provisional list of species recorded in Lancashire since 1950 includes:

MOSSES

Bryum riparium

Campylium elodes

LIVERWORTS

* *Haplomitrium hookeri*

Justification

Britain is particularly rich in bryophytes because of its geographical position in the path of the North Atlantic Drift. Many bryophyte species which are rare in a European context are not nationally rare in Britain (see Guideline Br1(a)). Some of them are, however, `nationally scarce', being recorded only in 16 to 100 10km squares (inclusive) in Britain. Britain therefore has an international responsibility to conserve populations of these species.

Br2 Any site which supports a population of a `nationally scarce' bryophyte species not covered by guideline Br1(b).

Application

All sites for bryophytes in this category (as listed in Hodgetts 1992) should be included. Those species recorded in Lancashire since 1950 include:

MOSSES

Alonia aloides var. *ambigua*
* *Amblyodon dealbatus*
Amblystegium confervoides
Amblystegium jungermannioides
Amblystegium serpens var. *salinum*
Andreaea rothii ssp. *rothii*
Anomobryum filiforme var. *concinnatum*

Brachydontium trichodes
Bryum canariense
Bryum donianum
Bryum dunense
Bryum elegans
Bryum intermedium
Bryum pallescens
Bryum pseudotriquetrum var. *bimum*
Bryum riparium
Bryum torquescens

Campylium elodes
Campylium polygamum

(1) Stewart and Church (in prep).

* last recorded between 1950 - 1977

Campylopus subulatus
Campylostelium saxicola
* *Catoscopium nigritum*
* *Cinclidium stygium*

Didymodon acutus
Didymodon nicholsonii
Discelium nudum
Distichium inclinatum

Ephemerum serratum var. *serratum*
Eurhynchium schleicheri
Eurhynchium striatulum

Fissidens limbatus
Fissidens rufulus
Fissidens taxifolius var *pallidicaulis*
Fontinalis antipyretica var *gracilis*
Funaria muhlenbergii

Grimmia orbicularis

Hypnum imponens

Leucobryum juniperoideum

Mnium thomsonii

Phascum cuspidatum var. *piliferum*
Philonotis arnellii
Philonotis caespitosa
Plagiopus oederiana
* *Plagiothecium cavifolium*
Plagiothecium laetum
Plagiothecium ruthei
Platydictya confervoides
Pleurochaete squarrosa
Pohlia lescuriana
Pohlia muyldermansii ssp. *pseudomuyldermansii*

Racomitrium sudeticum
Rhynchostegium lusitanicum
Rhytidium rugosum

* *Schistostega pennata*
Seligeria acutifolia
Seligeria donniana
Seligeria pusilla
Sphagnum angustifolium
Sphagnum flexuosum

Thuidium recognitum
Tortella inclinata
Tortula subulata var. *graeffii*
Tortula subulata var. *subinermis*

Weissia brachycarpa var. *brachycarpa*
Weissia controversa var. *crispata*
Weissia controversa var. *densifolia*

LIVERWORTS

Barbilophozia atlantica

Calypogeia azurea
Calypogeia integristipula
Cephalozia catenulata
Cephalozia loitlesbergeri
Cephalozia macrostachya
Cololejeunea rossettiana

Jamesoniella autumnalis
Jungermannia subelliptica

Kurzia sylvatica

Lophocolea fragrans

Nardia geoscyphus

Pedinophyllum interruptum

Riccardia incurvata
Riccia beyrichiana
Riccia subbifurca

Scapania uliginosa

Justification

`Nationally scarce' species occur in 16 to 100 10km squares (inclusive) in Britain; there is a national responsibility for their conservation.

Br3 Any site which supports a population of a bryophyte species which is recorded from 3 or fewer localities in Lancashire.

Application

All sites for bryophytes in the above category which are not included under Guidelines Br1 or Br2 should be considered. The following list of species recorded since 1950 should be regarded as a guide only since it may include species which are under-recorded:

MOSSES

Amblystegium jungermannioides
Andreaea rothii ssp. *falcata*

Bartramia ithyphylla
Bartramia pomiformis
Bryoerythrophyllum ferruginascens
Bryum alpinum
* *Bryum bornholmense*
Bryum capillare var. *rufifolium*

Calliergon giganteum
Campylopus atrovirens
Cinclidotus mucronatus

* last recorded between 1950 - 1977

Dichodontium flavescens
Dicranella subulata
Diphyscium foliosum

Entodon concinnus
Entosthodon fascicularis
Entosthodon obtusus

Fissidens celticus

Grimmia donniana var. *donniana*

Hygrohypnum luridum var. *subsphaericarpon*

Isopterygiopsis pulchella

Orthotrichum tenellum

* *Plagiothecium latebricola*
Pohlia bulbifera
Pohlia cruda
Pohlia drummondii
Pohlia elognata ssp. *elongata*
Pottia lanceolata
Pottia starckeana ssp. *conica*
Pottia starckeama ssp. *minutula*
Pterogonium gracile
* *Ptilium crista-castrensis*

Racomitrium aquaticum
Racomitrium elongatum
Rhabdoweisia crispata
Rhodobryum roseum
Rhynchostegium megapolitanum

Schistidium maritimum
Sphagnum contortum
Sphagnum teres
Sphagnum warnstorfii
Splachnum ampullaceum

Thuidium philibertii
Tortella densa
Tortula laevipila
Tortula muralis var. *aestiva*
Tortula papillosa
Tortula ruraliformis

Warnstorfia sarmentosa
Weissia rutilans

Zygodon rupestris

LIVERWORTS

Anastrophyllum minutum

Barbilophozia barbata
Bazzania tricrenata

Calypogeia sphagnicola

Fossombronia wondraczeki
Frullania fragilifolia

Harpanthus scutatus
Hygrobiella laxifolia

Jungermannia paroica

Leiocolea bantriensis
Lejeunea patens
Lophozia sudetica

* *Phaeoceros laevis*
Plagiochila spinulosa

Riccia fluitans

Scapania compacta
Scapania curta
Scapania subalpina

Justification

This list includes some species which may be common elsewhere in Britain, but are rare in Lancashire, largely because of past atmospheric pollution or loss of habitat. Small relict populations of such species survive mainly in the remoter parts of the County. Subject to further localities for these species being discovered, they may provisionally be regarded as `endangered' in a County context.

Frullania fragilifolia

* last recorded between 1950-1977

Br4

Any site which supports a significant proportion of the Lancashire population, or contributes significantly to the range in Lancashire, of a bryophyte species which is recorded from more than 3 localities in the County, but which could be at risk because of very small populations, recent rapid decline, or habitat loss or change.

Application

Sites for bryophyte species in the above categories (not included under Guidelines Br1 or Br2) may be considered for inclusion where they significantly extend the geographical range of the species in Lancashire, or support a significant proportion of the known total County population of that species.

The following list of species so far recorded at 4 to 10 localities in Lancashire should be regarded as a guide since it may include species which are under-recorded:

MOSSES

Aloina aloides ssp. *aloides*
Andreaea rupestris var. *rupestris*
Anomobryum filiforme var. *filiforme*
Aphanorhegma patens
Archidium alternifolium

Brachythecium mildeanum
Breutelia chrysocoma
Bryum algovicum var. *rutheanum*

Campylium stellatum var. *protensum*
Cratoneuron commutatum var. *falcatum*
Cryphaea heteromalla

Drepanocladus aduncus
Drepanocladus exannulatus var. *exannulatus*

Fissidens gracilifolius
Fissidens osmundoides

Hylocomium brevirostre
Hymenostylium recurvirostrum
Hypnum lindbergii

Myrinia pulvinata

Orthothecium intricatum
Orthotrichum lyellii
Orthotrichum rivulare
Orthotrichum stramineum

Plagiobryum zieri
Polytrichum alpinum
Polytrichum longisetum

Racomitrium ericoides
Rhizomnium pseudopunctatum

Sanionia uncinata
Sphagnum compactum
Sphagnum magellanicum
Splachnum sphaericum

Tetraplodon mnioides
Thuidium delicatulum
Tortella flavovirens
Tortella nitida

Warnstorfia exannulata

Zygodon viridissimus var. *stirtonii*

LIVERWORTS

Anastrepta orcadensis
Apometzgeria pubescens

Blasia pusilla
Blepharostoma trichophyllum

Cladopodiella fluitans

Jungermannia exsertifolia var. *cordifolia*
Jungermannia hyalina
Jungermannia obovata

Leiocolea alpestris
Leiocolea badensis
Lepidozia cupressina
Lophozia bicrenata
Lophozia excisa

Marchesinia mackaii
Metzgeria fruticulosa

Odontoschisma denudatum

Plagiochila britannica
Porella cordeana var. *cordeana*

Saccogyna viticulosa
Scapania irrigua

Trichocolea tomentella
Tritomaria quinquedentata

Justification

Species included here, whilst not in immediate danger of extinction in the County may, nevertheless, be at risk and could fall into the `endangered' category (see Br3: Justification) without adequate preventative measures.

Br5 Any site supporting an assemblage of 5 or more species of Atlantic bryophytes.

Application

Any site with an assemblage of five or more Atlantic bryophytes, as defined by Ratcliffe (1968) and modified by Averis (1991), should be considered. For guidance purposes, the eligible species which have been recorded in Lancashire include the following.

MOSSES

Breutelia chrysocoma
Bryum riparium

Campylopus atrovirens
Campylopus brevipilus
Campylopus subulatus
Fissidens celticus

Hyocomium armoricum

Leptodontium flexifolium

Orthotrichum pulchellum
Orthotrichium rivulare
Orthotrichum sprucei

Ptychomitrium polyphyllum

Rhynchostegium lusitanicum

Schistidium maritimum

Tetrodontium brownianum

Ulota drummondii
Ulota phyllantha

Zygodon conoideus

LIVERWORTS

Anastrepta orcadensis

Jungermannia paroica

Kurzia sylvatica
Kurzia trichoclados

Lejeunea lamacerina
Lejeunea patens
Lejeunea ulicina
Lepidozia cupressina
Lepidozia pearsonii
Lophocolea fragrans

Marchesinia mackaii
Metzgeria temperata

Plagiochila spinulosa

Saccogyna viticulosa

Scapania gracilis

Justification

Communities of Atlantic bryophytes are of international importance and are particularly well represented in western Britain.

iii) STONEWORTS AND OTHER ALGAE

Application (all algae guidelines)

The following guidelines apply only to stoneworts (charophytes), flowerless aquatic plants of uncertain taxonomic affinities probably distantly related to green algae. Only sites from which relevant species records have been made since 1987 should be considered.

Justification (all algae guidelines)

Although generally little-known and under-recorded, stoneworts are conspicuous aquatic plants, characteristic of a range of relatively unpolluted lowland waters, especially large ponds, pools and canals. Insufficient data is presently to hand on the distribution of other algae (most of which are microscopic) to include guidelines based upon them.

St1 Any site which supports a population of a stonewort species included in *Red Data Books of Britain and Ireland: Stoneworts.*[1]

Application

Those national Red Data Book species which occur or may occur in Lancashire include:

Tolypella prolifera

Justification

These are nationally rare species which have not been recorded recently from many of their former localities in Britain. The conservation of these species and their habitats is a national responsibility.

(1) Stewart and Church (1993)

St2

Any site which supports a population of a `nationally scarce' stonewort species, as listed in *Guidelines for the selection of Sites of Special Scientific Interest: non-vascular plants.*[1]

Application

Those `nationally scarce' stonewort species which occur or may occur in Lancashire include:

Chara aspera
Chara pendunculata

Tolypella glomerata

Justification

Although widespread in Britain, these are species which occur in more than 16 but less than 100 10km squares nationally. They have not been recorded recently from most of their former localities in Britain.

St3

Any site supporting a population of a stonewort species which is recorded from 3 or fewer localities in Lancashire.

Application

The species to which the guideline may apply include:

Chara globularis

Nitella flexilis

These species are likely to be under-recorded in Lancashire and further survey may reveal that sites which support them should be treated under Guideline St4.

Justification

Although these are species which are of frequent occurrence in some parts of Britain, they are rare in much of lowland England and in Lancashire. Subject to further localities for these species being discovered they may provisionally be regarded as `endangered' in a County context.

St4

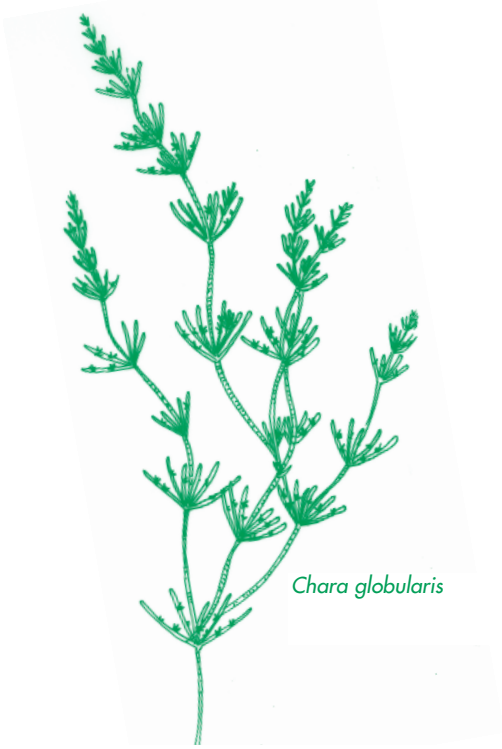
Any site which supports a significant proportion of the total Lancashire population, or contributes significantly to the range in Lancashire, of a stonewort species which occurs in more than 3 localities in the County, but which may be at risk because of small populations, recent rapid decline or habitat loss or change.

Application

Sites for stonewort species in the above categories which are not included under Guidelines St1 or St2 may be considered for inclusion where they significantly extend the geographical range of the species in Lancashire, or support a significant proportion of the known total County population of that species. It is considered that the systematic recent recording of stoneworts in Lancashire is insufficiently advanced to allow any reasonably complete listing of species to be produced for this guideline. See also St3 Application.

Justification

Species included here, whilst not in immediate danger of extinction in the County may, nevertheless, be at risk and could fall into the `endangered' category without adequate preventative measures. See also St3 Justification.



Chara globularis

(1) Hodgetts (1992)

7.3 FUNGI

Application (all fungi guidelines)

The production of visible fruiting bodies, by means of which most fungi are identified, may be irregular and is influenced by many environmental factors. Moreover, the distribution of fungi in Lancashire is imperfectly known in many cases, and the species lists given below should be regarded as tentative. They include species recorded since 1950, those species not known to have been recorded since 1977 being shown with an asterisk. Whilst the general rule of post-1987 records only being eligible should be borne in mind, consideration may be given to sites where relevant records have been made between 1978 and 1986 where it appears that no gross habitat change has occurred which would have been likely to result in the loss of the species concerned.

Fu1 **Any site which supports a fungus species included in the *Red Data List of British Fungi.*[1]**

Application

Those Red Data List species which have been recorded since 1950 in Lancashire include:

ASCOMYCETES

Geoglossum barlae
Microglossum olivaceum

BASIDIOMYCETES

Aphyllophorales

Clavaria corbierei
Clavaria guilleminii
Clavaria purpurea
* *Clavaria zollingeri*
Clavicorona taxophila
Clavulinopsis microspora
Clavulinopsis umbrinella

Hydnellum concrescens

Phellodon confluens
Phellodon melaleucus
Ramaria broomei
Ramaria palmata
Ramaria subbotrytis
Ramariopsis biformis
Ramariopsis crocea
Ramariopsis pulchella
Ramariopsis tenuiramosa

Agaricales

Amanita friabilis

Cortinarius auroturbinatus
Cortinarius caesiocyaneus
Cortinarius olidus
Cortinarius porphyropus
Cortinarius sodagnitus
Cortinarius subfulgens

Entoloma bloxamii

Hygrocybe calyptraeformis
Hygrophorus melizeus

Inocybe calospora
Inocybe fibrosa

Leptonia rosea

Melanoleuca subpulverulenta

Tricholoma atrosquemosum

Justification

A relatively large number of fungi are regarded as being a risk in a national context, mainly because of woodland and grassland habitat loss or change, or because of atmospheric pollution.

Fu2 **Any site which supports a `nationally scarce' fungus species.**

Application

All sites for fungus species in this category should be included. A list of species to which this guideline applies is not yet available.

Justification

`Nationally scarce' species occur 16 to 100 10km squares (inclusive) in Britain; there is a national responsibility for their conservation.

Fu3 **Any site which supports a fungus species which is recorded from 3 or fewer localities in Lancashire.**

Application

A list of species to which this guideline applies is not yet available. However, the following two species, previously considered to be lichens, are included:

Stenocybe pullatula
Stenocybe septata

Justification

Subject to further localities for these species being discovered, they may provisionally be regarded as `endangered' in a County context.

(1) Ing (1995)

* last recorded between 1950 - 1977

7.4. MAMMALS

Application

(all mammal guidelines)

Acceptable evidence of the presence of mammal species includes sightings of animals, their nests and in appropriate cases, faecal material. Sites may be considered for inclusion if they fulfil any of the following guidelines based upon post-1987 records for the species concerned.

Red Squirrel

Ma1 (a) Any site which regularly supports a native population of mammal species (except bats) listed in Annex II of the Habitats Directive and in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

Application

Any site with a population of a mammal species in these categories should be included, except for those which are the result of recent deliberate introductions which do not form part of a recognised species recovery programme. Site selection is based primarily on regularly used breeding territories. However, consideration should be given to identifying areas utilized at other times of the year where these contribute to the essential habitat requirements of the species. Those species in Lancashire to which this guideline applies may include:

Arvicola terrestris	Water Vole
Lutra lutra	Otter
Martes martes	Pine Marten
* *Muscardinus avellanarius*	Common Dormouse
Sciurus vulgaris	Red Squirrel

Justification

These species are of restricted distribution, and have suffered a drastic decline in abundance, both nationally and within Lancashire. There is either a national or international obligation to secure the conservation of these species and their habitats.

Ma1 (b) Any site which regularly supports a roost of any species of bat, as included in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

Application

It is not intended that this guideline will be applied to domestic or industrial (including agricultural) buildings, whether or not they are in use by man. However, consideration may be given to certain types of artificial structures, such as tunnels, bridges, retaining walls and mine shafts. Any type of roost (nursery, hibernation, etc.) may be selected. The following bat species are presently known to occur in Lancashire:

Nyctalus noctula	Noctule
Eptesicus serotinus	Serotine
Plecotus auritus	Brown Long-eared Bat
Pipistrellus pipistrellus	Pipistrelle
Myotis nattereri	Natterer's Bat
Myotis daubentoni	Daubenton's Bat
Myotis mystacinus	Whiskered Bat
Myotis brandti	Brandt's Bat

Justification

All British bats are protected under section 9 of the Wildlife and Countryside Act 1981 in view of the threats faced by bats generally. Whilst the Pipistrelle - by far the commonest species in Britain and in Lancashire - is largely associated with buildings, natural habitats and other structures are also important, especially for the scarcer species.

NB. Whilst bats and their roost sites are protected under the Wildlife and Countryside Act 1981 (as amended), their foraging areas are not. Successful conservation of bats is dependent not only on the protection of roost sites but on the identification and protection of their key feeding areas. The National Bat Habitat Survey[1] investigated the use of numerical measures of bat flight activity. Such surveys of the habitats required by foraging bats in the County are not sufficiently advanced; consequently the quantitative information required to develop and apply a guideline relating to foraging habitat is not currently available. A standardised methodology for bat surveys should be available in the future with the publication of the *Bat Survey Manual*[2].

* There are no known recent records for dormouse from within the current administrative boundary of Lancashire.

(1) Walsh et al (1995) (2) Hutson (in prep.)

Ma2

Any site which regularly supports a native breeding population of a mammal species which is recorded from 3 or fewer localities in Lancashire.

Application

Any site with a population of a mammal species in this category should be included, except for those which are the result of recent deliberate introductions which do not form part of a recognised species recovery programme. On the basis of present knowledge, this guideline may apply to:

Apodemus flavicollis	Yellow-necked Mouse
Mustela putorius	Polecat

Justification

These species are extremely rare in Lancashire.

Ma3

Any site which regularly supports a native breeding population of mammal species which is recorded from more than 3 localities in Lancashire but which could be under threat because of small populations, recent rapid decline or habitat deterioration or loss.

Application

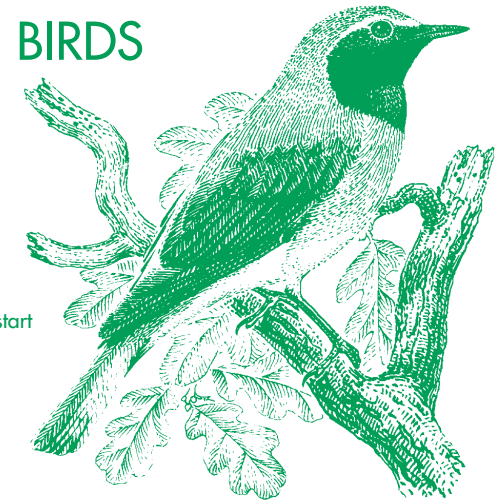
Any site with a population of a mammal species in these categories may be considered for inclusion, except for those which are the result of recent deliberate introductions which do not form part of a recognised species recovery programme. This guideline is presently considered to apply to the following species:

Micromys minutus	Harvest Mouse

Justification

Water vole is believed to have suffered a recent rapid decline over much of Britain, and especially in Lancashire. Harvest mouse is at the northern edge of its British range in Lancashire, where it is believed to exist only as a few small isolated populations.

7.5 BIRDS



Redstart

~~Application (all bird guidelines)~~

~~For the purposes of these guidelines, acceptable evidence of breeding by bird species includes: the presence of a territorial male; repeated sightings of the species concerned in suitable habitat during the breeding season; pair behaviour during the breeding season; birds seen nest-building or carrying nest material; birds seen carrying food or faecal sacs; fledgling birds seen; or an occupied nest is found. It is not intended that these guidelines should be applied to domestic, industrial or agricultural buildings, whether or not they are in use.~~

~~Account should also be taken of the fact that birds are generally far more mobile than other animals; many show well defined, but sometimes complex, patterns of migration. This means that sites other than breeding sites are also essential to their well-being. Such areas may include those regularly used for major pre- or post breeding gatherings, migration staging posts, moulting and during different stages of the winter.~~

~~Justification~~

~~More recently obtained, systematic data is available on the occurrence and distribution of birds in Lancashire than for other species-groups. Moreover, Lancashire's birds are, as a species-group, of national and international importance, principally by virtue of the breeding raptor populations in the uplands, rare breeding species of lowland wetlands and the huge flocks of wintering and passage-migrant waders and wildfowl on the coast. Such factors, together with the need to protect breeding as well as non-breeding sites (see above), mean that the guidelines for site selection on the basis of birds are organised somewhat differently to those for most other animal species-groups.~~

REVISED GUIDELINES FOR SELECTION OF BIOLOGICAL HERITAGE SITES (2006)

(These Guidelines relating to birds replace those in the Biological Heritage Sites Guidelines for Site Selection, published in 1998 and those approved and adopted by the Lancashire County Council Scheme of Delegation 6 July 2005)

7.5 BIRDS

Introduction

The Biological Heritage Sites Guidelines (LCC 1998) included guidance for the selection of sites for bird interest based upon the best available data at that time. However, the publication of the status of European birds (Tucker G.M. & Heath M.F. 1994), national data on the status of birds (Gregory R.D. 2002) and systematic information on breeding birds in Lancashire (Pyefinch R. and Golborn P. 2001) together with subsequent surveys or published information, provided the basis for an update and review of the bird guidelines.

The new bird guidelines more or less follow the same format as those published in 1998 but have been modified to take into account European, national and county changes. At a national level the Red and Amber Lists (Gregory R.D. 2002) provide a link with UK Biodiversity Action Plan priority bird species. The identification of important sites for such species is an important contribution to the delivery of UK and Lancashire biodiversity action.

In the 1998 guidelines the abbreviation (Bi) prefaces each of the bird guidelines, in order to prevent confusion this is replaced by (Av) in the new guidelines.

Guideline (Av8) has undergone the most significant change. In the 1998 publication the SSSI guidelines were followed with only the thresholds changed to recognise county rather than national status. This had the disadvantage of including many species that were never likely to occur as wild breeding species in Lancashire. In these guidelines, Pyefinch R. and Golborn P. (2001), has been used to develop more appropriate assemblages of species for Lancashire habitats.

There is no equivalent to guideline (Bi8) in the new guidelines, as the particular survey and report on which the guideline was based, has not been repeated. In addition new guidelines under (Av8) are intended to cover reservoirs and other water-bodies.

Most Biological Heritage Sites selected by these guidelines comprise discrete areas of semi-natural or artificial habitats. However, one particular guideline (AvW) deals with over-wintering wildfowl and involves considerable tracts of land used for intensive agricultural production. Whilst these sites reflect a different kind of relationship between the bird species concerned and their environment, the purpose of the guideline is to recognise the international importance of flocks of wildfowl and waders, principally Pink-footed Goose, Whooper Swan and Bewick's Swan. Considering that Lancashire supports over 10% of the world population of the Pink-footed Goose, the international obligation and the conservation importance of these areas needs to be recognised. The wildfowl and wader sites are mapped differently than in other Biological Heritage Sites in order to maintain a distinction.

Application (all bird guidelines)

For the purposes of these guidelines, acceptable evidence of breeding by bird species includes: the presence of a territorial male; repeated sightings of the species concerned in suitable habitat during the breeding season; pair behaviour during the breeding season; birds seen nest-building or carrying nest-material; birds seen carrying food or faecal sacs; fledgling birds seen; or an occupied nest found. These guidelines apply to important sites for other essential activities by breeding birds, i.e. feeding areas where these are an integral part of the breeding sites and lek sites. However, it is not intended that these guidelines should be applied to domestic, industrial or agricultural buildings, whether or not they are in use.

Account should also be taken of the fact that birds are generally far more mobile than other animals; many show well defined, but sometimes complex, patterns of migration. This means that sites other than breeding sites are also essential to their well being. Such areas may include those regularly used for major pre- or post-breeding gatherings, migration staging posts, moulting and during different stages of the winter.

In applying these revised guidelines reference should be made to Part A: Introduction of the Biological Heritage Sites Guidelines (LCC 1998) and particularly to paragraphs 3.11 to 3.16 covering species guidelines.

Justification

More recently obtained, systematic data is available on the occurrence and distribution of birds in Lancashire than for other species-groups (Pyefinch R. and Golborn P. 2001). Moreover, Lancashire's birds are, as a species-group, of national and international importance, principally by virtue of the breeding raptor populations in the uplands, rare breeding species of lowland wetlands and the huge flocks of wintering and passage-migrant waders and wildfowl in coastal locations. Such factors, together with the need to protect breeding as well as non-breeding sites (see above), mean that the guidelines for site selection on the basis of birds are organised somewhat differently to those for most other animal species-groups.

Av1 Any site which regularly supports a wild breeding population of a nationally rare species.

Application

Nationally rare breeding species are defined as: all UK Red List and Amber List species (or which qualify for inclusion on the Red List), which have been identified as rare breeders in Gregory R.D. *et al* (2002): all SPEC1 species; SPEC 2/3 species identified in view of a small breeding population size or restricted distribution in Tucker G.M. and Heath M.F. (1994). All sites regularly supporting such species should be identified. The species to which this guideline should be applied in Lancashire include:

- Black-necked Grebe
- Bittern
- Spoonbill
- Little Egret
- Pintail
- Garganey
- Honey Buzzard
- Osprey
- Red Kite
- Marsh Harrier
- Spotted Crake
- Ruff
- Black-tailed Godwit
- Mediterranean Gull
- Black Redstart
- Savi's Warbler
- Marsh Warbler
- Firecrest
- Common Rosefinch

Justification

Britain has a national and, in many cases, an international obligation to conserve these species and their habitats.

Av2 Any site which regularly supports a wild breeding population of a rare Lancashire breeding bird species.

Application

Rare Lancashire breeding bird species are those recorded from five or fewer tetrads/sites in Lancashire. All sites regularly supporting such species should be identified. The species to which this guideline should be presently applied include:

- Pochard
- Eider
- Red-breasted Merganser
- Black Grouse
- Quail
- Hen Harrier
- Goshawk
- Hobby
- Water Rail
- Avocet
- Great Black-backed Gull
- Arctic Tern
- Common Tern
- Turtle Dove
- Nightjar
- Bearded Tit
- Crossbill
- Hawfinch

Justification

Whilst not as rare nationally as breeding species as those under Av1, these birds are rare as breeding species in Lancashire, in some cases with very small populations. A Lancashire rare breeding bird is taken as occuring in 5 or fewer tetrads or sites in the County i.e. <0.6% of tetrads, a recommended threshold in line with UK Biodiversity Action Plan (BAP) Guidance, *Evaluating priorities and setting targets for habitats and species*. Guidance Note 4. UK Local Issues Advisory Group (UK LIAG. 1997). The *Atlas of the Breeding Birds of Lancashire and North Merseyside* (Pyefinch R. and Golborn P. 2001) together with subsequent surveys or published information has been used as the base-line data.

Av3	**Any site which regularly supports a significant breeding population of a scarce Lancashire breeding bird.**

Application

Scarce Lancashire breeding bird species are those recorded from 32 or fewer tetrads/sites in Lancashire. Sites regularly meeting the qualifying threshold should be identified. The species, together with their individual threshold population size, to which this guideline should be presently applied include:

- Grey Heron (5 occupied nests)
- Teal (1 pair)
- Gadwall (2 pairs)
- Shoveler (2 pairs)
- Merlin (1 pair)
- Peregrine (1 pair)
- Little Ringed Plover (2 pairs)
- Ringed Plover (2 pairs)
- Golden Plover (2 pairs)
- Dunlin (1 pair)
- Long-eared Owl (2 pairs)
- Short-eared Owl (1 pair)
- Lesser Spotted Woodpecker (1 pair)
- Yellow Wagtail (2 pairs)
- Ring Ouzel (1 pair)
- Wood Warbler (1 pair)
- Willow Tit (1 pair)
- Raven (1 pair)
- Twite (1 pair)

Justification

A Lancashire scarce breeding bird is taken as occurring in 32 or fewer tetrads or sites in the County i.e. <4.0% of tetrads, a recommended threshold in line with UK Biodiversity Action Plan (BAP) Guidance, *Evaluating priorities and setting targets for habitats and species*. Guidance Note 4 UK Local Issues Advisory Group (UK LIAG. 1997). The species listed and their thresholds come from survey work undertaken for the *Atlas of the Breeding Birds of Lancashire and North Merseyside*

(Pyefinch R. and Golborn P. 2001) up dated by subsequent surveys or published information. Populations of these species at the minimum thresholds are considered significant in a Lancashire context.

Av4	**Any site which regularly supports a significant and regular wild breeding population in Lancashire of certain UK bird species suffering a rapid decline.**

Application

This guideline applies to UK BAP priority species or those included on or qualifying for the "Red List" in Gregory R.D. *et al* (2002) by reason of suffering a rapid national population decline of more than 50% in the last 25 years. Consideration may be given to any site which regularly supports a significant proportion of the Lancashire population, or which represents a significant extension of the range of the species concerned in the county. Significant importance in Lancashire is defined as 0.5% or more of the county population and the individual thresholds have been calculated on this basis. This guideline should be applied to the following species:

- Grey Partridge (12 pairs)
- Skylark (40 pairs)
- Song Thrush (25 pairs)
- Grasshopper Warbler (2pair)
- Spotted Flycatcher (3 pairs)
- Marsh Tit (2 pairs)
- Starling (75 pairs)
- House Sparrow (175 pairs)
- Tree Sparrow (5 pairs)
- Linnet (25 pairs)
- Bullfinch (9 pairs)
- Yellowhammer (5 pairs)
- Reed Bunting (10 pairs)
- Corn Bunting (5 pairs)

A few of these species regularly use man-made habitats. However, this guideline is not generally intended to apply to domestic dwellings, or gardens, or to industrial, or agricultural buildings.

This guideline may also be applied to register the presence of one or more of these species on a site qualifying under another guideline, even when the population, in terms of the qualifying threshold, is not considered significant.

Justification

These UK BAP priority species that are included on the Red List in Gregory R.D. *et al* (2002) are species of high conservation concern whose national, or international populations, or ranges have rapidly declined recently or historically. Some are of global conservation concern. Whilst a number of species from the Red List included under this guideline are not necessarily rare in Lancashire they are nonetheless species for which there is a national or international responsibility and whose populations should be taken into account in the site selection process.

Av5	Any site which regularly supports 0.5% or more of the total wild British breeding population of any native bird species.

Application

Sites identified under this guideline may include habitats or features used for activities associated with breeding including feeding and display.

Justification

The figure of 1% of the national population has become the accepted standard for identifying nationally important sites for those bird species, which gather in large numbers at relatively few sites. Similarly a number of non-statutory site systems have used a figure of 0.5% as being indicative of an important site at County level; this figure has been adopted in these guidelines.

Av6	Any site which regularly supports 0.5% or more of the British population of any wild species outside the breeding season.

Application

Sites identified under this guideline comprise habitats and features which regularly support significant numbers of non-breeding birds. They may include roosting, over-wintering, passage or other sites not used for breeding. Population sizes of most wildfowl and wader species are given in the Annual Report of the Wetland Birds Survey (WeBS) published by the Wildfowl and Wetlands Trust and the British Trust for Ornithology; whilst a range of journals and publications give population sizes for other species.

Justification

Such sites are important for the conservation of these species outside the breeding season and/or for juvenile non-breeding individuals. The figure of 1% of the national population has become the accepted standard for identifying nationally important sites for those bird species which gather in large numbers at relatively few sites. Similarly a number of non-statutory site systems have used a figure of 0.5% as being indicative of an important site at County level; this figure has been adopted in these guidelines.

Av7 Any site which regularly supports a significant non-breeding population in Lancashire of a bird species not included in Guideline Av6.

Application

This Guideline may be applied to any site which regularly supports a significant proportion of the County's population of certain bird species when roosting, over-wintering, on passage or at other times outside the breeding season. Roosting and over-wintering populations should normally occupy a site for a minimum of six weeks per annum whilst passage sites must, by necessity, be for a shorter period. At present, this guideline has been applied to the following:

Bittern	1 or more birds;
Long-eared Owl	3 or more birds;
Hirundine flocks (swallows and martins)	300 or more birds.

Consideration may be given to other species in the future as adequate data become available.

Justification

Such sites are important for the conservation of these species outside the breeding season and/or for juvenile non-breeding individuals.

Av8 Any site which supports a breeding wild bird assemblage with a total score, calculated from the values in Table 6, which equals or exceeds the threshold site index values shown in that Table.

Application

The general note on definitions of terms used in bird guidelines applies here. Site boundaries should include land used for activities associated with breeding.

Justification

This guideline is intended to identify important assemblages of different bird species, characteristic of particular habitats, which are significant in a county context. The bird species listed under each habitat-type, and their scores, have been based on the *Guidelines for the selection of biological SSSIs* (NCC 1989), but have been modified according to information on distribution and population size in Lancashire from *Atlas of the Breeding Birds of Lancashire and North Merseyside* (Pyefinch R. and Golborn P. 2001) updated by subsequent surveys or published information. Threshold site-index values have been revised and set at a level (between half and two thirds the SSSI threshold) to reflect County significance.

Table 6 Breeding Bird Assemblages of Different Habitats (See Guideline Av8)

a) Sand-Dunes and Saltmarshes					
Spoonbill	6	Black-tailed Godwit	5	Short-eared Owl	3
Shelduck	2	Curlew	2	Whinchat	2
Eider	2	Redshank	2	Stonechat	2
Oystercatcher	2	Mediterranean Gull	5	Wheatear	2
Avocet	4	Black-headed Gull	1	Grasshopper Warbler	3
Ringed Plover	3	Herring Gull	1	Sedge Warbler	1
Lapwing	1	Great Black-backed Gull	3	Linnet	1
Dunlin	3	Common Tern	3	Reed Bunting	1
Ruff	5	Arctic Tern	3	Corn Bunting	2
Snipe	2	Cuckoo	2	Grey Partridge	
Threshold Value: 14					

b) Lowland Damp Grassland					
Mute Swan	2	Corncrake	5	Redshank	2
Shelduck	2	Oystercatcher	2	Cuckoo	2
Gadwall	4	Avocet	4	Short-eared Owl	3
Teal	3	Lapwing	1	Yellow Wagtail	3
Pintail	5	Ruff	5	Whinchat	2
Garganey	5	Snipe	2	Grasshopper Warbler	3
Shoveler	4	Black-tailed Godwit	5	Sedge Warbler	1
Marsh Harrier	5	Curlew	2	Reed Bunting	1
Quail	5	Grey Partridge	1		
Threshold Value: 10					

c) Lowland Fen					
Little Grebe	2	Spotted Crake	6	Grasshopper Warbler	3
Bittern	5	Water Rail	3	Sedge Warbler	1
Gadwall	4	Moorhen	1	Reed Warbler	2
Teal	3	Coot	1	Marsh Warbler	5
Garganey	5	Snipe	2	Bearded Tit	4
Shoveler	4	Cuckoo	2	Reed Bunting	1
Pochard	4	Whinchat	2		
Marsh Harrier	5	Cetti's Warbler	4		
Threshold Value: 10					

d) Lowland Open Waters and their Margins					
Little Grebe	2	Tufted Duck	2	Black-headed Gull	1
Great Crested Grebe	2	Red-breasted Merganser	3	Common Tern	3
Black-necked Grebe	5	Marsh Harrier	5	Cuckoo	2
Bittern	5	Osprey	5	Kingfisher	3
Grey Heron	3	Spotted Crake	6	Yellow Wagtail	3
Spoonbill	6	Water Rail	3	Grey Wagtail	2
Mute Swan	2	Moorhen	1	Cetti's Warbler	4
Shelduck	2	Coot	1	Grasshopper Warbler	3
Gadwall	3	Avocet	4	Sedge Warbler	1
Teal	3	Little Ringed Plover	3	Reed Warbler	2
Pintail	5	Ringed Plover	3	Marsh Warbler	5
Garganey	5	Snipe	2	Bearded Tit	4
Shoveler	4	Redshank	2	Reed Bunting	1
Pochard	4	Mediterranean Gull	5		

Threshold Value: 19

e) Upland Waters and their Margins					
Little Grebe	2	Osprey	5	Mediterranean Gull	5
Great Crested Grebe	2	Moorhen	1	Herring Gull	1
Black-necked Grebe	5	Coot	1	Great Black-backed Gull	3
Grey Heron	3	Oystercatcher	2	Common Tern	3
Mute Swan	2	Ringed Plover	3	Kingfisher	3
Wigeon	4	Little Ringed Plover	3	Grey Wagtail	2
Teal	3	Dunlin	3	Pied Wagtail	1
Shoveler	4	Snipe	2	Dipper	2
Tufted Duck	2	Curlew	2	Grasshopper Warbler	3
Goldeneye	5	Redshank	2	Sedge Warbler	1
Red-Breasted Merganser	3	Common Sandpiper	2	Reed Bunting	1
Goosander	3	Black-headed Gull	1		

Threshold Value: 15

f) Upland Moorland and Grassland with Water Bodies					
Little Grebe	2	Black Grouse	4	Great Black-backed Gull	3
Wigeon	4	Grey Partridge	1	Cuckoo	2
Teal	3	Moorhen	1	Short-eared Owl	3
Pintail	5	Coot	1	Grey Wagtail	2
Goldeneye	5	Golden Plover	2	Dipper	2
Red-breasted Merganser	3	Lapwing	1	Whinchat	2
Goosander	3	Dunlin	3	Stonechat	2
Hen Harrier	5	Snipe	2	Wheatear	2
Buzzard	3	Curlew	2	Ring Ouzel	4
Osprey	5	Redshank	2	Raven	3
Merlin	3	Common Sandpiper		Twite	4
Peregrine	4	Black-headed Gull	1	Linnet	1
Red Grouse	2	Herring Gull	1		

Threshold Value: 20

g) Upland Moorland and Grassland without Water Bodies					
Teal	3	Golden Plover	2	Short-eared Owl	3
Hen Harrier	5	Lapwing	1	Whinchat	2
Buzzard	3	Dunlin	3	Stonechat	2
Merlin	3	Snipe	2	Wheatear	2
Peregrine	4	Curlew	2	Ring Ouzel	4
Red Grouse	2	Redshank	2	Raven	3
Black Grouse	4	Cuckoo	2	Twite	4
Grey Partridge	1			Linnet	1
Threshold Value: 15					

h) Lowland Heath					
Hobby	4	Cuckoo	2	Whinchat	2
Quail	5	Long-eared Owl	3	Stonechat	2
Snipe	2	Nightjar	3	Wheatear	2
Curlew	2	Woodlark	4	Grasshopper Warbler	3
Redshank	2	Tree Pipit	2	Linnet	1
Threshold Value: 12					

i) Scrub (excluding heath)					
Turtle Dove	5	Song Thrush	1	Linnet	1
Cuckoo	2	Grasshopper Warbler	3	Lesser Redpoll	1
Long-eared Owl	3	Whitethroat	1	Bullfinch	1
Nightjar	3	Lesser Whitethroat	2	Yellowhammer	1
Woodlark	4	Garden Warbler	1	Reed Bunting	1
Tree Pipit	2	Blackcap	1		
Whinchat	2	Tree Sparrow	1		
Stonechat	2	Goldfinch	1		
Threshold Value: 10					

j) Woodland					
Grey Heron	3	Nightjar	3	Long-tailed Tit	1
Little Egret	5	Green Woodpecker	2	Marsh Tit	2
Honey Buzzard	5	Great Spotted Woodpecker	2	Willow Tit	3
Red Kite	5	Lesser Spotted Woodpecker	4	Coal Tit	1
Goshawk	5	Tree Pipit	2	Nuthatch	2
Sparrowhawk	2	Redstart	1	Treecreeper	1
Buzzard	3	Song Thrush	1	Jay	1
Kestrel	2	Mistle Thrush	1	Jackdaw	1
Osprey	5	Garden Warbler	1	Raven	3
Hobby	4	Blackcap	1	Tree Sparrow	1
Black Grouse	4	Wood Warbler	3	Siskin	2
Woodcock	2	Chiffchaff	1	Lesser Redpoll	1
Stock Dove	1	Goldcrest	1	Common Crossbill	3
Cuckoo	2	Firecrest	5	Bullfinch	1
Tawny Owl	2	Spotted Flycatcher	1	Hawfinch	3
Long-eared Owl	3	Pied Flycatcher	2		

Threshold Value: 23

k) Rivers and Canals					
Little Grebe	2	Little Ringed Plover	3	Dipper	2
Great Crested Grebe	2	Ringed Plover	3	Cetti's Warbler	4
Mute Swan	2	Common Sandpiper	2	Sedge Warbler	1
Tufted Duck	2	Kingfisher	3	Marsh Warbler	5
Goosander	3	Sand Martin	1	Reed Warbler	2
Red-breasted Merganser	3	Yellow Wagtail	3	Reed Bunting	1
Coot	1	Pied Wagtail	1		
Moorhen	1	Grey Wagtail	2		
Threshold Value: 19					

Av9 Any site comprising in-bye land or lowland permanent grassland which regularly supports a significant breeding population of wader species not included under Guideline Av2.

Application

This guideline should be applied to sites which support:

10 pairs of breeding lapwing; or
3 pairs of breeding snipe; or
4 pairs of breeding curlew; or
3 pairs of breeding redshank.

This guideline should be applied to individual fields or clusters of adjacent fields, which are managed in a similar way. The current level of knowledge in the county does not permit the use of a breeding density measurement in this guideline, or the use of a composite index based upon combinations of two or more of the above species.

Although they can be of considerable importance for breeding lapwing, arable fields, short-term leys or other disturbed land are not covered by this guideline.

Justification

Much concern has been expressed about the threat presented to breeding wader populations by agricultural change within the UK. Surveys (Campbell *et al*. 1993 and White 2003) have highlighted the importance of Lancashire for breeding waders.

Av10	Any site from which the following have been recorded: a) 45 breeding bird species; or b) 60 breeding and wintering bird species; or c) 100 breeding, wintering and passage species.

Application

This guideline may be applied to sites which offer an exceptional range of habitat opportunities for birds. Any authentic record of a species making regular use of the site may be included.

Justification

Complex habitat mosaics may be very valuable for birds, including sites which are of particular importance to passage migrants and winter visitors outside the breeding season.

AvW	Any site within which 0.5% or more of the British population of any wild non-breeding species of wildfowl or wading bird is regularly present.

Application

Certain sites qualifying under this guideline usually cover considerable tracts of land used for intensive agricultural production. This applies to feeding sites for Pink-footed Goose, Whooper Swan and Bewick's Swan. The conservation interest of these sites is, in part, a direct result of this agricultural use. However, in any one year, the birds will tend to use specific fields within a larger area, depending on the crop grown – the fields used by birds will consequently shift from year to year within the larger area.

Population sizes of most wildfowl and wader species are given in the Annual Report of the Wetland Birds Survey (WeBS) published by the Wildfowl and Wetlands Trust and the British Trust for Ornithology. Data from several consecutive years is essential, not only to establish the regular use, but also to determine the boundary of the area within which the birds will move from year to year.

It should be noted that sites identified under this Guideline are shown differently than other Biological Heritage Sites owing to the nature of their interest; being in the main extensive areas of intensive agricultural land rather than discrete habitats or features. In this way they differ from sites selected under Guideline Av6.

Justification

Wintering and passage populations in Lancashire of certain wildfowl and wading birds are of national, and in some cases, of international significance.

References:

UK LIAG. 1997. *Guidance for Local Biodiversity Action Plans - Evaluating priorities and setting targets for habitats and species*. Guidance Note 4. UK Local Issues Advisory Group Reprinted 1997.

Pyefinch, R. & Golborn, P. 2001. *Atlas of the Breeding Birds of Lancashire and North Merseyside,* Hobby Publications.

Gregory R.D., Wilkinson N.I., Noble D.G., Robinson J.A., Brown A.F., Hughes J., Procter D., Gibbons D.W. and Galbraith C.A. *et al* 2002. The population status of birds in the United Kingdom, Channel Islands and Isle of Man an analysis of conservation concerns 2002-2007, *British Birds* 95, September 2002, 410-448.

LCC 1998 – *Biological Heritage Sites Guidelines for Site Selection*, Lancashire County Council.

NCC 1989. *Guidelines for the selection of biological SSSIs,* Nature Conservancy Council (Joint Nature Conservation Committee).

Tucker G.M. and Heath M.F. 1994. *Birds in Europe Their Conservation Status.* Bird Life International, Cambridge.

White S.J. 2003. Survey of breeding Lapwings in Lancashire. Lancashire Bird Report 2002.

Bi7 ~~Any site from which the following have been recorded:~~

~~a) 45 breeding bird species; or~~

~~b) 60 breeding and wintering bird species; or~~

~~c) 100 breeding, wintering and passage bird species.~~

~~Application~~

~~This guideline may be applied to sites which offer an exceptional range of habitat opportunities for birds. Any authentic record of species making active use of the site in the five years prior to site assessment may be included.~~

~~Justification~~

~~Complex habitat mosaics may be very valuable for birds, including sites which are of particular importance to passage migrants and winter visitors outside the breeding season.~~

Bi8 ~~Any reservoir or other water body assessed to be of "very high", "high" or "high to moderate" value for its wildfowl and/or wading birds in summer or winter[1].~~

~~Application~~

~~The Wetland Advisory Service's report (Quinn & Kirby 1992) was restricted to water bodies owned by North West Water, which account for the majority of reservoirs in Lancashire. However, the results of this study to evaluate the importance of larger water bodies for wildfowl and waders have also been used in the evaluation of a few other sites.~~

~~Justification~~

~~The purpose of this guideline is to identify those water bodies which support important numbers of wildfowl and/or wading birds and which are not identified under any other guidelines. Quinn and Kirby's report covers all North West Water holdings, which are located over a much wider area than Lancashire, and the site assessments have been made on this regional basis, thus assuring such sites of importance in a County context.~~

7.6 REPTILES AND AMPHIBIANS

i) REPTILES

Re1 Any site which regularly supports a population of any species of native reptile other than common lizard.

Application

The guideline covers the following species in Lancashire:

Vipera berus	Adder
Natrix helvetica	Grass Snake
Anguis fragilis	Slow Worm

Site boundaries should take account of habitat area utilised by these species at all times of year where these contribute to the essential requirement of the species e.g. hibernating habitats. Populations which are the result of deliberate introductions are not eligible, except where they form part of a recognised species recovery programme.

Justification

With the exception of the common lizard, all native species of reptile are believed to be rare or absent in Lancashire, populations of species present having declined to very low levels over a long period of time.

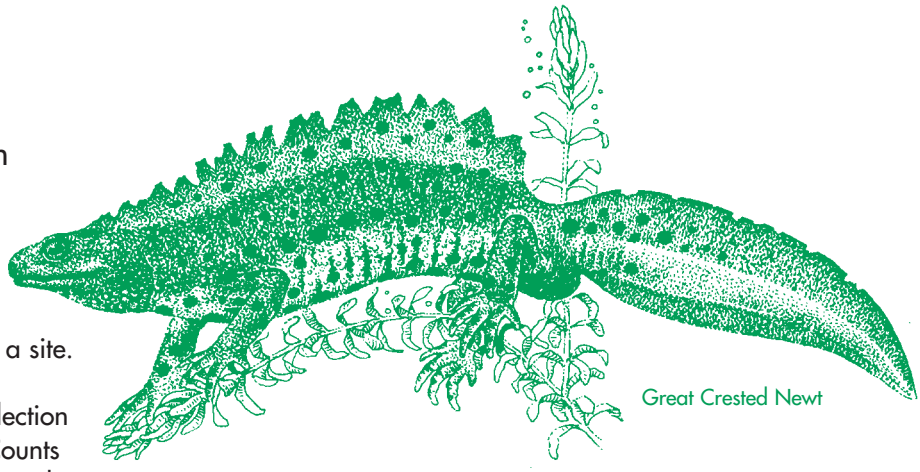
Adder

(1) Quinn and Kirby (1992)

ii) AMPHIBIANS

Application (all amphibian guidelines)

These are the only species guidelines (with the exception of Guideline Bi6) which are based on quantitative counts of individuals at a site. They are based closely on the corresponding guidelines for the selection of biological SSSIs (NCC 1989). Counts should be carried out only by adequately experienced amphibian surveyors.


Great Crested Newt

Eligible sites should be limited to those which support self-sustaining populations: garden ponds or other sites into which amphibians have been introduced and are sustained only by direct human intervention should be excluded.

Boundaries for amphibian sites should reflect the needs of these animals in both their aquatic and terrestrial phases. They should, where appropriate, include adjacent terrestrial habitat known or likely to be used by newts in particular, including hibernating sites. An amphibian site may contain more than one body of water. To determine the population size of a site where several ponds are utilised by amphibians, counts for each species are summed from all of the ponds within 250m of another pond in the same cluster, and not separated by any obvious barriers to dispersal. Other ponds within 500m of this core area may be important to the long-term viability of the site, as they can be considered to constitute part of the same metapopulation, and may, therefore, be considered for inclusion.

The numbers of amphibians returning to breeding ponds may fluctuate considerably from year to year. To overcome this, and achieve a more accurate estimation of population sizes and stability, counts made during the breeding season should be available for each species for at least 3 years. These counts should be averaged, the averages then scored as instructed below, and consideration for designation as a Biological Heritage Site based on the final score. Where counts are available for less than 3 years, sites which achieve the qualifying scores may be included as provisional entries.

Justification (all amphibian guidelines)

All amphibian species are believed to have declined significantly over Britain in recent years, largely as a result of habitat loss and pollution. Lancashire remains an important county for amphibians, and the protection of the best breeding sites and associated terrestrial habitat is justified for all species.

Am1a **Any site which regularly supports a "good" population of great crested newt.**

Application

The terms `low', `good' and `exceptional' are defined in Table 7, reproduced from NCC (1989). The scoring system shown in Table 7 has been further developed by Grayson *et al.* (1991) by including an evaluation of the number of eggs present in the breeding season, and by scoring ponds that occur in clusters more highly than those which are isolated. Thus, any site may be considered for inclusion under this guideline if it supports a population of great crested newt *(Triturus cristatus)* characterised as follows:

five or more adults observed or netted in day time; or
ten or more adults counted by torchlight at night; or
ten or more adults caught in bottle traps; or
eggs estimated at many 100s; or
newts breeding in four or more ponds in a cluster.

Justification

The great crested newt is a species which is vulnerable in Europe and, considered to be a species of Community interest in need of strict protection. As a consequence it is afforded special protection under the Wildlife and Countryside Act 1981 (as amended) and the EC Habitats Directive.

Field work by Grayson and others in north west England (Grayson *et al.* 1991) has shown that egg search techniques can provide an estimation of the relative size of populations of great crested newt, whose eggs are easily distinguished in the field from those of other newts. Such studies have also indicated the importance of pond clusters in ensuring the survival of great crested newt populations over a number of years.

Am1b Any site which regularly supports a population of natterjack toad.

Application

The natterjack toad *(Bufo calamita)* is now believed to be extinct in the administrative county of Lancashire. Any site which in future satisfies this guideline, including those supporting planned re-introductions of this species, will be considered for inclusion.

Justification

Natterjack toad receives special protection under the Wildlife and Countryside Act 1981 (as amended), being a rare species in Britain.

Am2 Any site which regularly supports an "exceptional" population of any amphibian species.

Application

This guideline applies to all sites (including relevant terrestrial habitats), which support `exceptional' populations of amphibians not included in (see Guideline Am1a or Am1b), as defined in Table 7.

Justification

See "all amphibian guidelines".

Am3a Any site which regularly supports five species of amphibians.

Application

All sites regularly supporting all three newts, common frog and common toad should be selected.

Justification

Sites supporting all three newt species, common frog and common toad are uncommon nationally, being restricted to those geographical areas where the ranges of all the species coincide.

Am3b Any site with an amphibian species assemblage score of 7 or more.

Application

The scoring system follows NCC (1989), reproduced as Table 7.

Scores must be for breeding sites observed during the breeding season. Daytime netting should be made during a 15-minute period for sites with less than 50m of water's edge, for 30 minutes for sites with 50-100m, etc. To compute the total score for a site, add the scores for individual species and add one point for four of these species present and two points for five species.

TABLE 7 A scoring system for the selection of sites with assemblages of amphibians. (From NCC 1989) (See Guidelines Am3b)

			`Low' Population Score 1	`Good' Population Score 2	`Exceptional' Population Score 3
Amphibians	Great Crested Newt	Seen or netted in day Counted at night	<5 <10	5-50 10-100	>50 >100
	Smooth Newt	Netted in day) Counted at night)	<10	10-100	>100
	Palmate Newt	Netted in day) Counted at night)	<10	10-100	>100
	Common Toad	Estimated Counted	<500 <100	500-5,000 100-1,000	>5,000 >1,000
	Common Frog	Spawn clumps counted	<50	50-500	>500

7.7 FISH

Fi1 **Any site which supports a native population of a fish species protected under the EC Habitats Directive.**

Application

This guideline applies to populations of:

Cottus gobio	Bullhead
Lampetra fluviatilis	River Lamprey
Lampetra planeri	Brook Lamprey
Salmo salar	Salmon

All rivers regularly supporting populations of river lamprey, brook lamprey or salmon should be included. Site boundaries should have regard to sections of river important for both spawning and for development of fry, as well as for migration. The bullhead, whilst declining internationally, is still widely distributed in Lancashire's rivers, and in this respect should not, of itself, qualify a river for inclusion except where such populations contribute significantly to the distribution pattern, or the total population size, in the County.

Justification

There is a national and international obligation to protect these species and their habitats.

River Lamprey

7.8 INVERTEBRATES

Application (all invertebrate guidelines)

Identification of sites on the basis of their invertebrate animal species should take account of the needs of many invertebrates for habitat and structural diversity, both at the `macro' and `micro' scales. Small-scale habitats of particular importance to some invertebrates, such as dead wood or small patches of bare ground, occur and indeed may shift their position over time within large scale habitats e.g. woodland or grassland, on which the invertebrates also depend. Moreover the larval and adult phases of the same species often need quite different habitats. Invertebrates generally have annual life cycles, and their survival on a site depends on the continued availability of the right mixture of habitats at the right time of year - every year. Such factors should be taken into account when determining site boundaries.

Species lists, especially for less well-recorded groups of invertebrates, should be regarded as tentative. They include species recorded in Lancashire since 1950, those not recorded since 1978 being shown with an asterisk, or other notation.

It should be noted that the category `nationally scarce', referring to species believed to occur between 16 and 100 10km squares of the National Grid, is sometimes subdivided in relation to invertebrate groups into `Notable A' and `Notable B'. This subdivision has not been recognised in the following guidelines.

Justification

In Lancashire, as elsewhere, there are more species of invertebrate animals than of all plants and other animals combined. Many invertebrate groups and species have declined dramatically in recent decades, and their conservation is a matter of widespread concern in Europe. Until recently, it was thought that if sites were selected (and managed) on the basis of their botanical interest, then the invertebrates would automatically be catered for too. This is not so: it is important that due regard is paid to the contribution that invertebrates make to biodiversity, and of their habitat needs, in their own right, insofar as available information allows.

With such a large number of invertebrate groups, and the relative lack of knowledge about many of these, it is impossible to develop individual sets of guidelines for every species-group at the present time. Where there is an adequate database for a particular species-group relating to Lancashire, specific guidelines have been devised and appear below. For the remainder, there is a single, `catch all', section which follows the standard approach adopted throughout the species section.

i) BUTTERFLIES AND MOTHS (LEPIDOPTERA)

Application (all butterfly and moth guidelines)

For the purposes of these guidelines acceptable evidence of breeding by butterfly and moth species includes the presence of eggs, or larvae, or pupae, or repeated sightings of adults in suitable habitats. It should be noted that the lists of moth species are incomplete and, for certain guidelines, not yet available.

Justification (all butterfly and moth guidelines)

Butterflies are popular and conspicuous insects, and are relatively well-recorded. Moths are much more numerous in terms of species, and less well-recorded. Each species requires not only the right foodplant and habitat for its larvae but also suitable habitat and nectar-producing flowers for the adults. More than 20% of all British butterfly species are regarded as threatened in a national context.

Le1 Any site which regularly supports a breeding population of a species of butterfly or moth included in *British Red Data Books: 2. Insects.*[1]

Application

The species to which this guideline applies include:

BUTTERFLIES

Argynnis adippe	High Brown Fritillary

MOTHS

*	*Homoeosoma nimbella*	Small clouded Knot-horn
	Lycia zonaria	Belted Beauty
	Photedes captiuncula	Least Minor

High Brown Fritillary

Justification

The species in the above category are threatened or rare in Britain and there is a national responsibility for their conservation. The high brown fritillary, in particular, has suffered a dramatic decline in Britain since 1950. There is an urgent national need to conserve its few remaining populations, some of the most important of which are in Lancashire.

Le2 Any site which regularly supports a breeding population of a `nationally scarce' species of butterfly or moth.

Application

The species to which this guideline applies include:

BUTTERFLIES

	Aricia agestis	Brown Argus
	Aricia artaxerxes	Northern Brown Argus
	Boloria euphrosyne	Pearl-bordered Fritillary
	Coenonympha tullia	Large Heath
*	*Erebia aethiops*	Scotch Argus
	Hamearis lucina	Duke of Burgundy

MOTHS

	Actebia praecox	Portland Moth
	Adscita geryon	Cistus Forester
*	*Agrotis ripae*	Sand Dart
	Anania funebris	White-spotted Sable
	Atolmis rubricollis	Red-necked Footman
*	*Carsia sororiata*	Manchester Treble-bar
*	*Catarhoe rubidata*	Ruddy Carpet
	Chilodes maritimus	Silky Wainscot
	Chlorissa viridata	Small Grass Emerald
	Crambus ericella	Heath Grass-veneer
*	*Crambus hamella*	Pearl-streak Grass-veneer
	Deltolte uncula	Silver Hook
	Discoloxia blomeri	Blomer's Rivulet
	Eana penziana	A tortrix moth
*	*Eriogaster lanestris*	Small Eggar
	Eucosmomorpha albersana	A tortrix moth
*	*Eudonia delunella*	Resin Grey
	Eudonia lineola	A pyralid moth
	Eupithecia expallidata	Bleached Pug
	Eurrhypara terrealis	Northern Pearl
*	*Euxoa cursoria*	Coast Dart
*	*Hypenodes humidialis*	Marsh Oblique-barred
	Idaea muricata	Purple-bordered Gold

(1) Shirt (1987)

* *Last recorded 1950-1977*

*	*Microstega pandalis*	Bordered Pearl
*	*Mythimna litoralis*	Shore Wainscot
*	*Olethreutes olivana*	A tortrix moth
*	*Pechipogon strigilata*	Common Fan-foot
*	*Pediasia aridella*	Saltmarsh Grass-veneer
	Perconia strigillaria	Grass Wave
	Perizoma minorata ssp. *ericetata*	Heath Rivulet
	Perizoma taeniata	Barred Carpet
	Phalonidia curvistrigana	A micro-moth
*	*Rheumaptera hastata*	Argent and Sable
*	*Scoparia ancipitella*	Elm Grey
	Sideridis albicolon	White Colon
	Sitochroa palealis	A pyralid moth
	Thera juniperata	Juniper Carpet
	Tetheella fluctuosa	Satin Lutestring
	Trichopteryx polycommata	Barred Tooth-striped
*	*Xylena exsoleta*	Sword Grass

Justification

Nationally scarce species are recorded only from 16-100 10km squares (inclusive) in Britain; there is a national responsibility to ensure their conservation.

Le3

Any site which regularly supports a breeding population of a species of butterfly or moth which occurs at 3 or fewer localities in Lancashire.

Application

All sites for species in the above category which are not included in Guidelines Le1 or Le2 should be considered.

The species to which this guideline applies include:

BUTTERFLIES

Argynnis aglaja	Dark Green Fritillary

MOTHS

List of species not available.

Justification

Although more widespread nationally than those species listed under Guidelines Le1 and Le2, this species is very rare in Lancashire.

Le4

Any site which regularly supports a breeding population of a species of butterfly or moth which is recorded from more than three localities in Lancashire, but which could be at risk because of small populations, habitat loss or change, or is at the edge of its British range, where such populations contribute significantly to the distribution pattern or the total population size of that species in the County.

Application

Sites for butterflies and moths in the above categories (not included under Guidelines Le1 or Le2) may be considered for inclusion where they significantly extend the geographical range of the species in Lancashire, or support a significant proportion of the estimated total County population of that species. The species to which the guideline applies include:

BUTTERFLIES

Boloria selene	Small Pearl-bordered Fritillary
Callophyrys rubi	Green Hairstreak
Erynnis tages	Dingy Skipper
Gonepteryx rhamni	Brimstone
Hipparchia semele	Grayling
Pararge aegeria	Speckled Wood
Polygonia c-album	Comma
Quercusia quercus	Purple Hairstreak
Strymonidia w-album	White-letter Hairstreak

MOTHS

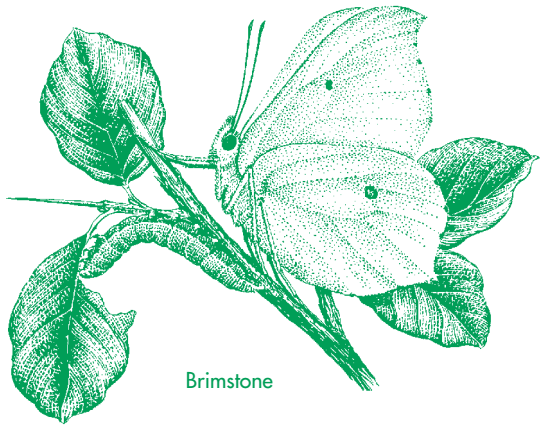
List of species not available.

Justification

Species included here, whilst not as rare in Lancashire as those under Guidelines Le1, Le2 or Le3, are nevertheless either of very restricted distribution or exist only as small scattered populations in the County.

* *Last recorded 1950-1977*

Le5 Any site which regularly supports breeding populations of 9 or more butterfly species (excluding those species which are migratory or are largely associated with cultivated plants).



Brimstone

Application

The following species are relevant for the purposes of this guideline:

BUTTERFLIES

Aglais urticae	Small Tortoiseshell
Anthocharis cardamines	Orange Tip
Boloria selene	Small Pearl-bordered Fritillary
Callophrys rubi	Green Hairstreak
Celastrina argiolus	Holly Blue
Coenonympha pamphilus	Small Heath
Erynnis tages	Dingy Skipper
Gonepteryx rhamni	Brimstone
Hipparchia semele	Grayling
Inachis io	Peacock
Lasiommata megera	Wall
Lycaena phlaeas	Small Copper
Maniola jurtina	Meadow Brown
Ochlodes venata	Large Skipper
Pararge aegeria	Speckled Wood
Pieris napi	Green-veined White
Polyommatus icarus	Common Blue
Pyroia tithonus	Gatekeeper
Quercusia quercus	Purple Hairstreak
Strymonidia w-album	White-letter Hairstreak
Thymelicus sylvestris	Small Skipper

MOTHS

List of species not available

Justification

The purpose of this guideline is to identify sites with significant habitat and structural diversity, not involving crop or cultivated plants, which support notable assemblages of breeding butterflies.

ii) DRAGONFLIES AND DAMSELFLIES (*ODONATA*)

~~Application (all dragonfly and damselfly guidelines)~~

~~For the purposes of these guidelines, acceptable evidence of breeding by dragonfly and damselfly species includes a female seen ovipositing, or the identification of larvae or the identification of exuvia. Wherever possible, the most recent record of breeding should be within 3 years of the site selection date.~~

~~When defining site boundaries, adjacent semi-natural terrestrial habitat, including night perching habitat, should be included, according to the known requirements of the species present. Sites may include more than one water body (including ponds, ditches, streams and rivers) where they are linked by suitable habitat.~~

~~Justification (all dragonfly and damselfly guidelines)~~

~~Dragonflies are a conspicuous and popular group which have been relatively well recorded in recent years. All species have aquatic larvae which spend from 1 to 3 years in water. The abundance of these species is to some extent a useful indicator of the state of the aquatic environment generally: small lakes and large lowland ponds usually support the greatest diversity of species.~~

~~Od1~~ ~~Any site which regularly supports a breeding population of a species of dragonfly or damselfly included in *British Red Data Books: 2. Insects*~~[1]~~.~~

~~Application~~

~~There are presently no Lancashire records for the species to which this guideline relates.~~

~~Justification~~

~~The species in the above category are either threatened or rare in Britain and there is a national responsibility for their conservation.~~

(1) Shirt (1987)

7.8 ii) DRAGONFLIES AND DAMSELFLIES (*ODONATA*)

Application (all dragonfly and damselfly guidelines)

For the purposes of these guidelines, acceptable evidence of breeding by dragonfly and damselfly species includes one or more of: a female seen ovipositing; the identification of exuvia; records of larvae; emerged larval cases; fresh teneral insects; mating and ovipositing by adults in suitable habitat; or the recurrence of a significant population over several years. Wherever possible, the most recent record of breeding should be within 3 years of the site selection date.

When defining site boundaries, adjacent semi-natural terrestrial habitat, including night-perching habitat, should be included, according to the known requirements of the species present. Sites may include more than one water body (including ponds, ditches, streams and rivers) where they support the same population or metapopulation .

Justification (all dragonfly and damselfly guidelines)

Dragonflies are a conspicuous group popular with naturalists and which has been relatively well-recorded in recent years. All species have aquatic larvae which spend from 1 to 3 years in water. The abundance of these species is to some extent a useful indicator of the state of the aquatic environment generally: small lakes and large lowland ponds usually support the greatest diversity of species.

These guidelines and site selection have been based upon an assessment of the information gathered for the dragonfly atlas [(1)].

Odo1	Any site which regularly supports a breeding population of a species of dragonfly or damselfly included in the current National red list[(2)].

Application

There are presently no Lancashire records for any species to which this guideline relates.

Justification

The species in the above category are either threatened or rare in Britain and there is a national responsibility for their conservation.

Odo2	Any site which regularly supports a breeding population of a 'nationally scarce' species of dragonfly or damselfly.

Application

The species to which this guideline applies are identified in the current list of Lancashire Key Species as *'Nationally Scarce'*. At this time the only relevant species is:

Sympetrum fonscolombii	Red-veined Darter

Lesser Emperor (*Anax parthenope*) has been recorded in Lancashire and would be included here if regular breeding were proven.

Justification

Nationally scarce species are recorded only from 16-100 10km squares (inclusive) in Britain; their conservation is a matter of national concern.

Odo3	Any site which regularly supports a breeding population of a species of dragonfly or damselfly which is identified as *Rare within Lancashire* in the current list of Lancashire Key Species.

Application

Any site for species in this category which are not covered by Guidelines Odo1 or Odo2 may be considered for inclusion. The species to which this guideline applies occur in 5 or fewer tetrads in Lancashire and are identified in the current list of Lancashire Key Species as *'Rare within Lancashire*'. At this time the relevant species are:

Orthetrum coerulescens	Keeled Skimmer
Sympetrum sanguineum	Ruddy Darter

Red-veined Darter (*Sympetrum fonscolombii*) is a rare breeder in Lancashire but is listed under Odo2.

Justification

These are species which, although relatively common in some parts of England, are rare breeders in Lancashire. Subject to further localities being colonised or discovered, they may be regarded as `endangered' in a County context.

Odo4	Any site which regularly supports a breeding population of a species of dragonfly or damselfly which is identified as *Scarce in Lancashire* in the current list of Lancashire Key Species where such populations contribute significantly to the distribution pattern, or the total population size, of that species in the County.

Application

Any site for species in this category which are not covered by Guidelines Odo1, Odo2 or Odo3 may be considered for inclusion.

The species to which this guideline applies occur in 32 or fewer tetrads in Lancashire and are identified in the current list of Lancashire Key Species as '*Scarce within Lancashire*'. At this time there are no species to which this guideline applies.

Over the coming years the only likely candidates for inclusion would be any of the species listed in Odo 2 or Odo 3 should their range expand, or Golden-ringed Dragonfly if that contracted. Additionally, Red-eyed Damselfly is now breeding at a number of locations in Merseyside and it appears likely that it will spread into Lancashire.

Justification

Many dragonfly species are highly mobile, and some are presently expanding their ranges in Britain.

Species included here, whilst not as rare in Lancashire as those under Guideline Odo3, are nevertheless either of very restricted distribution, or exist only as small scattered populations, in the County. These species would be regarded as `scarce' in a County context.

Odo5	Any site which regularly supports a breeding population of 10 or more species of dragonfly or damselfly in Table A.

Application

Any site which satisfies this guideline should be included. The following species are relevant for the purposes of this guideline:

Table A. Damselfly and Dragonfly Assemblage Species

SCIENTIFIC NAME	COMMON NAME
Aeshna cyanea	Southern Hawker
Aeshna grandis	Brown Hawker
Aeshna juncea	Common Hawker
Aeshna mixta	Migrant Hawker
Anax imperator	Emperor Dragonfly
Calopteryx splendens	Banded Demoiselle
Coenagrion puella	Azure Damselfly
Cordulegaster boltonii	Golden-ringed Dragonfly
Enallagma cyathigerum	Common Blue Damselfly
Ischnura elegans	Blue-tailed Damselfly
Lestes sponsa	Emerald Damselfly
Libellula depressa	Broad-bodied Chaser
Libellula quadrimaculata	Four-spotted Chaser
Orthetrum cancellatum	Black-tailed Skimmer
Orthetrum coerulescens	Keeled Skimmer
Pyrrhosoma nymphula	Large Red Damselfly
Sympetrum danae	Black Darter
Sympetrum fonscolombii	Red-veined Darter
Sympetrum sanguineum	Ruddy Darter
Sympetrum striolatum	Common Darter

Justification

The purpose of this guideline is to identify sites with high structural and habitat diversity which support notable assemblages of dragonflies and damselflies.

Any species listed under Odo1-Odo3 have not been included here as they would automatically qualify a site for selection. Should this change then they should be considered here.

Acknowledgements
The BHS Partnership wishes to express its appreciation to Steve White, British Dragonfly Society Recorder for VC59 and VC 60, for his expert knowledge and assistance given to the review of these guidelines.

References

(1) White, SJ & Smith PH. 2015. *The Dragonflies of Lancashire and North Merseyside*. Lancashire & Cheshire Fauna Society.
(2) Caroline Daguet, Dr Graham French and Dr Pam Taylor (Eds), 2008. *The Odonata Red List for Great Britain*. British Dragonfly Society.

Od5

~~Any site which regularly supports breeding populations of 7 or more species of dragonfly or damselfly.~~

~~Application~~

~~Any site which satisfies this guideline should be included. The following species are relevant for the purposes of this guideline:~~

~~*Aeshna cyanea*~~	~~Southern Hawker~~
~~*Aeshna grandis*~~	~~Brown Hawker~~
~~*Aeshna juncea*~~	~~Common Hawker~~
~~*Anax imperator*~~	~~Emperor Dragonfly~~
~~*Coenagrion puella*~~	~~Azure Damselfly~~
~~*Cordulegaster boltonii*~~	~~Golden-ringed Dragonfly~~
~~*Enallagma cyathigerum*~~	~~Common Blue Damselfly~~
~~*Ischnura elegans*~~	~~Blue-tailed Damselfly~~
~~*Lestes sponsa*~~	~~Emerald Damselfly~~
~~*Libellula quadrimaculata*~~	~~Four-spotted Chaser~~
~~*Pyrrhosoma nymphula*~~	~~Large Red Damselfly~~
~~*Sympetrum danae*~~	~~Black Darter~~
~~*Sympetrum striolatum*~~	~~Common Darter~~

~~Justification~~

~~The purpose of this guideline is to identify sites with high structural and habitat diversity which support notable assemblages of dragonflies and damselflies.~~

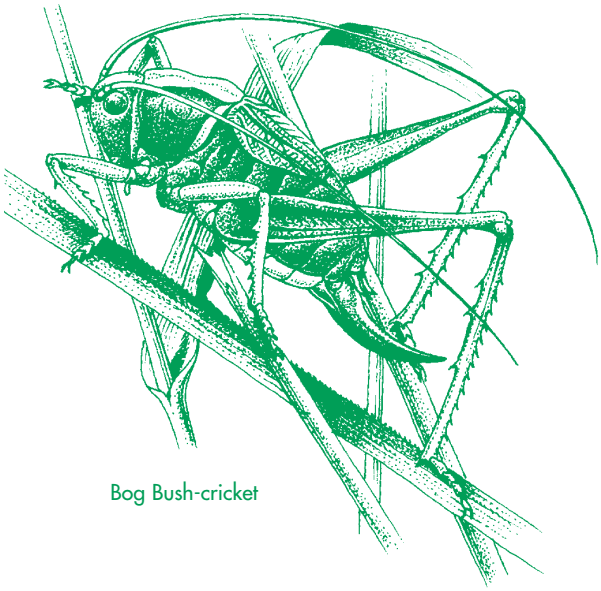
iii) GRASSHOPPERS AND CRICKETS (*ORTHOPTERA*)

Application (all grasshopper and cricket guidelines)

Much less mobile generally than *Lepidoptera* or *Odonata*, acceptable evidence of grasshopper or cricket populations includes sightings of the animals, or hearing of their songs if recorded by a competent surveyor.

Justification (all grasshopper and cricket guidelines)

A popular group whose species are readily identified in the hand in most cases. Most species are found in unimproved dry or damp grassland, marshes or bogs, but the specific requirements of particular species - like the height of the vegetation, for example - may be quite precise.



Bog Bush-cricket

Or1

Any site which regularly supports a population of a species of grasshopper or cricket included in *British Red Data Books: 2 Insects.*[1]

Application

There are no known Lancashire records for the species to which the guideline applies.

Justification

The species in the above category are either threatened or rare in Britain and there is a national responsibility for their conservation.

Or2

Any site which regularly supports a population of a `nationally scarce' species of grasshopper or cricket.

Application

The species to which this guideline applies include:

Metrioptera brachyptera	Bog Bush-cricket
Metrioptera roeselii	Roesel's Bush-cricket

Justification

Nationally scarce species are recorded only from 16-100 10km squares (inclusive) in Britain; their conservation is a matter of national concern.

(1) Shirt (1987)

Or3

Any site which regularly supports a population of a species of grasshopper or cricket which occurs at 3 or fewer localities in Lancashire.

Application

Any site for species in this category which are not covered by Guidelines Or1 or Or2 may be considered. The species to which this guideline may apply include:

Meconema thalassinum	Oak Bush-cricket
Pholidoptera griseoaptera	Dark Bush-cricket
Tetrix subulata	Slender Ground-hopper

Justification

These are species which, although frequent in some parts of England, are rare in Lancashire. Subject to further localities being colonised or discovered, they may provisionally be regarded as `endangered' in a County context.

Or4

Any site which regularly supports a population of a species of grasshopper or cricket which is recorded from more than 3 localities in Lancashire, but which could be at risk because of small populations, recent rapid decline, habitat loss or change, or is at the edge of its British range, where such populations contribute significantly to the distribution pattern or the total population size of that species in the County.

Application

Sites for species in the above categories (not included under Guidelines Or1 or Or2) may be considered for inclusion where they significantly extend the known geographical range of the species in Lancashire, or support a significant proportion of the estimated total County population of that species. Further survey may show that this guideline may apply to one or more species listed under Guideline Or3.

Justification

Such species, whilst not qualifying under Guideline Or3, are nevertheless either of very restricted distribution, or exist only as small scattered populations, in Lancashire.

Or5

Any site which regularly supports populations of 3 or more grasshopper or cricket species.

Application

Any site which satisfies this guideline should be included. The following species are relevant for the purposes of this guideline:

Chorthippus brunneus	Field Grasshopper
Chorthippus parallelus	Meadow Grasshopper
Myrmeleotettix maculatus	Mottled Grasshopper
Omocestus viridulus	Common Green Grasshopper
Tetrix undulata	Common Ground-hopper

Justification

The purpose of this guideline is to identify sites which have structural and habitat diversity suitable for a range of grasshoppers.

iv) MOLLUSCS (*MOLLUSCA*)

Application (all mollusc guidelines)

Acceptable evidence of the presence of mollusc species includes finds of living animals or empty shells. The following guidelines relate only to terrestrial and freshwater species.

Justification (all mollusc guidelines)

Molluscs are one of the few non-insect groups of invertebrates to be relatively well-recorded in recent years, although recording in Lancashire is patchy. They have poor powers of dispersal, and some terrestrial species are particularly good indicators of long continuity of habitat conditions.

Mo1

Any site which regularly supports a population of a species of mollusc listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) or in *British Red Data Books: 3. Invertebrates other than insects.*[1]

Application

This species to which this guideline applies include:

Lymnaea glabra	Mud Pond Snail
Margaritifera margaritifera	Freshwater Pearl Mussel
Vertigo angustior	Narrow-mouthed Whorl Snail

Narrow-mouthed Whorl Snail

Justification

The species in the above category are either threatened or rare in Britain and there is a national responsibility for their conservation.

The whorl snail listed is now very rare in Britain, although, interestingly, it is much more widespread as a fossil from the Flandrian period.

Mo2

Any site which regularly supports a population of a `nationally scarce' species of mollusc.

Application

The species to which this guideline applies include:

Abida secale	Large Chrysalis Snail
Acicula fusca	Point Shell
Clausilia dubia	Craven Door Snail
Pisidium pulchellum	A pea mussel
Vertigo alpestris	Mountain Whorl Snail
Vertigo pusilla	Wall Whorl Snail
Vitraea subrimata	A glass snail

Justification

Nationally scarce species are recorded only from 16-100 10km squares (inclusive) in Britain; their conservation is a matter of national concern.

Mo3

Any site which regularly supports a population of a species of mollusc which occurs at 3 or fewer localities in Lancashire.

Application

Any site for species in this category which are not covered by Guidelines Mo1 or Mo2 should be considered. The species to which this guideline applies includes:

Pomatias elegans	Round-mouthed Snail

Justification

This species, although frequent in some parts of England, is rare in Lancashire. Subject to further localities being colonized or discovered, they may provisionally be regarded as `endangered' in a County context.

Mo4

Any site which regularly supports a population of a species of mollusc which is recorded from more than 3 localities in Lancashire, but which could be at risk because of recent rapid decline, small populations, habitat loss or change, or is at the edge of its British range, where such populations contribute significantly to the distribution pattern or the total population size of that species in the County.

(1) Bratton (1991)

Application

Sites in the above categories (not included under Guidelines Mo1 or Mo2) may be considered for inclusion where they significantly extend the known geographical range of a species in Lancashire, or supports a significant proportion of the estimated total County population of that species. The species to which this guideline may apply include:

Acanthinula aculeata	Prickly Snail
Aplexa hypnorum	A bladder snail
Ashfordia granulata	Silky Snail
Azeca goodalli	Three-toothed Snail
Balea perversa	Tree Snail
Bathyomphalus contortus	A ramshorn snail
Cecilioides acicula	Blind Snail
Cernuella virgata	Striped Snail
Cochlodina laminata	Plaited Door Snail
Columella aspera	A whorl snail
Helicigona lapicida	Lapidary Snail
Leiostyla anglica	English Chrysalis Snail
Leucophytia bidentata	A hollow-shelled snail
Limax cinereoniger	Ash-grey Slug
Milax gagates	Smooth Jet Slug
Pisidium lilljeborgii	A pea mussel
Pupilla muscorum	Moss Snail
Pyramidula rupestris	Rock Snail
Spermodea lamellata	Plaited Snail
Sphaerium rivicola	A freshwater cockle
Unio pictorum	A freshwater mussel
Unio tumidus	A freshwater mussel
Vallonia pulchella s.s.	Beautiful Snail
Vertigo antivertigo	Marsh Whorl Snail
Vertigo substriata	A whorl snail
Viviparus contectus	Lister's River Snail
Zenobiella subrufescens	Dusky Snail

Justification

Such species, whilst not qualifying under Guideline Mo3, are nevertheless either of very restricted distribution, or exist only as small scattered populations, in Lancashire.

v) OTHER INVERTEBRATES

Application (all Other Invertebrate guidelines)

The following guidelines should be applied to any invertebrate groups not covered elsewhere, including those for which no species are listed under the relevent guideline. Records of difficult or critical taxa should be subject to confirmation by a regional or national referee or other expert. Account has been taken of the provisional changes to Red Data Book status which are made in the national species-group reviews produced by the Nature Conservancy Council and its successor the Joint Nature Conservation Committee. The species lists below are known to be incomplete. These lists include species recorded in Lancashire since 1950, those not recorded since 1977 being shown with an asterisk or other notation. Only sites from which relevant records have been made since 1987 should usually be considered for designation as Biological Heritage Sites. However, consideration may be given to sites where records have been made between 1978 and 1986 where no gross habitat changes are evident that are likely to have affected the species concerned. Records made between 1950 and 1977 are considered to require confirmation and sites which qualify only on the basis of such records should be identified as provisional entries.

The species are listed in family order (Recorder version 3.21b) then alphabetically within families.

In1 Any site which regularly supports a population of an invertebrate species which is specifically protected under the Habitats Directive and/or listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and/or *British Red Data Books: 2 Insects*[1] or *British Red Data Books: 3 Invertebrates other than insects*[2], and not included under any other guideline.

(1) Shirt (1987)
(2) Bratton (1991)

Application

All sites in the above categories should be included. Relevant species records have been identified mainly from the Invertebrate Site Register (Parsons 1987) and national species-group reviews (see References). Species to which this guideline may apply include:

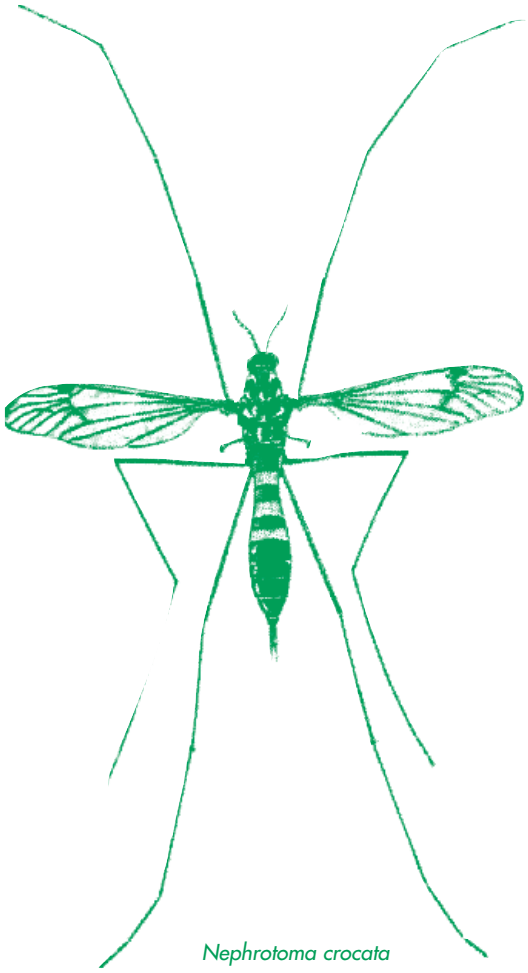
INSECTS

Beetles *(Coleoptera)*

>	*Acrotrichis pumila*	A featherwing beetle
*	*Agaricophagus cephalotes*	A round fungus beetle
<	*Colon angulare*	A round fungus beetle
<	*Leiodes lunicollis*	A round fungus beetle
<	*Bledius erraticus*	A rove beetle
>	*Cypha nitida*	A rove beetle
<	*Cypha ovulum*	A rove beetle
>	*Hydrosmectina delicatissima*	A rove beetle
>	*Neobisnius procerulus*	A rove beetle
<	*Omalium rugulipenne*	A rove beetle
<	*Phytosus nigriventris*	A rove beetle
>	*Rhopalocerina clavigera*	A rove beetle
<	*Scopaeus gracilis*	A rove beetle
<	*Tachyusa scitula*	A rove beetle
<	*Thinobius brevipennis*	A rove beetle
>	*Bibloplectus minutissimus*	A short-winged mould beetle
<	*Brachygluta pandellei*	A short-winged mould beetle
<	*Agriotes sordidus*	A click beetle
<	*Lymexylon navale*	A timber beetle
	Atomaria clavigera	A silken fungus beetle
>	*Telmatophilus schoenherri*	A silken fungus beetle
>	*Orthoperus aequalis*	A minute fungus beetle
<	*Hippodamia tredecimpunctata*	13-spot ladybird
<	*Corticeus unicolor*	A darkling beetle
<	*Acmaeops collaris*	A longhorn beetle
<	*Gracilia minuta*	A longhorn beetle
<	*Apteropeda splendida*	A leaf beetle
<	*Donacia bicolora*	A leaf beetle
<	*Ochrosis ventralis*	A leaf beetle
<	*Anthonomus rufus*	A weevil
<	*Ceutorhynchus arquatus*	A weevil
<	*Rhynchaenus testaceus*	A weevil

True Flies *(Diptera)*

?	*Erioptera meijerei*	A cranefly
*	*Gonomyia alboscutellata*	A cranefly
*	*Limnophila pictipennis*	A cranefly
?	*Molophilus czizeki*	A cranefly
	Molophilus lackschewitzianus	A cranefly
*	*Nephrotoma crocata*	A cranefly
-	*Scleroprocta pentagonalis*	A cranefly
*	*Tipula alpina*	A cranefly
*	*Tipula grisescens*	A cranefly
?	*Tipula hortorum*	A cranefly
*	*Triogma trisulcata*	A cranefly
*	*Haematopota bigoti*	A horse fly
	Dialineura anilis	A stiletto fly
*	*Empis prodromus*	A dance fly
*	*Platypalpus carteri*	A dance fly



Nephrotoma crocata

* Last recorded between 1950 - 1977
\- Last recorded before 1960
\+ Last recorded after 1960
? Date of last record unknown
< Last recorded prior to 1970
> Recorded post 1970

	Cheilosia chrysocoma	A hoverfly
	Cheilosia nebulosa	A hoverfly
	Doros profuges	A hoverfly
?	*Epistophella euchroma*	A hoverfly
*	*Sphaerophoria loewi*	A hoverfly
*	*Sarcophaga ebrachiata*	A flesh fly

Bees and Wasps *(Hymenoptera)*

?	*Hartigia xanthostoma*	A sawfly
?	*Hedychridium coriaceum*	A rubytail wasp
	Podalonia affinis	A mud wasp
	Psen littoralis	A solitary wasp
	Colletes cunicularius	The vernal colletes
	Osmia parietina	Wall Mason Bee
	Nomada lathburiana	A nomad bee
	Nomada robertjeotiana	A nomad bee

INVERTEBRATES OTHER THAN INSECTS

Nemertean Worms *(Enoplida)*

	Prostoma jenningsi	A nemertean worm

Crustaceans *(Crustacea)*

	Armadillidium pictum	A pill woodlouse
	Austropotamobius pallipes	Freshwater Crayfish

Justification

The species in the above category are either threatened or rare in Western Europe or Britain and there is either an international or national responsibility for their conservation.

In2 Any site which regularly supports a population of a `nationally scarce' invertebrate species not included under any other guideline.

Application

All sites in the above category may be considered for inclusion. However, recent surveys suggest that some species listed below may not in fact be nationally scarce, and this guideline should in practice be applied with discretion. `Nationally scarce' invertebrates, referred to as `Notable a' or `Notable b', are listed in the Invertebrate Site Register and national species-group reviews. Relevant nationally scarce species records may include:

INSECTS

Bugs *(Hemiptera)*

?	*Amblytylus brevicollis*	A plantbug or grassbug
?	*Globiceps cruciatus*	A plantbug or grassbug
?	*Globiceps flavomaculatus*	A plantbug or grassbug
?	*Monosynamma sabulicola*	A plantbug or grassbug
?	*Systellonotus triguttatus*	A plantbug or grassbug
?	*Trigonotylus psammaecolor*	A plantbug or grassbug
?	*Aphrodes aestuarinus*	A leafhopper
?	*Aphrodes limicola*	A leafhopper
?	*Aphrodes trifasciatus*	A leafhopper
	Cosmotettix caudatus	A leafhopper
?	*Macrosteles sordidipennis*	A leafhopper
	Trigonocranus emmeae	A lacehopper
?	*Chloriona dorsata*	A planthopper
	Issus muscaenormis	A beetle bug

Lacewings *(Neuroptera)*

	Wesmaelius balticus	A brown lacewing
	Chrysopa abbreviata	A green lacewing

Beetles *(Coleoptera)*

	Agonum nigrum	A ground beetle
	Bembidion bipunctatum	A ground beetle
	Bembidion fluviatile	A ground beetle
*	*Bembidion monticola*	A ground beetle
*	*Bembidion stomoides*	A ground beetle
<	*Dyschirius nitidus*	A ground beetle
	Haliplus apicalis	A crawling water beetle
	Haliplus heydeni	A crawling water beetle
	Agabus biguttatus	A water beetle
	Agabus unguicularis	A water beetle
	Dytiscus circumflexus	A water beetle
?	*Hydroporus neglectus*	A water beetle
	Hydroporus obsoletus	A water beetle
	Ilybius aenescens	A water beetle
	Ilybius fenestratus	A water beetle
	Ilybius guttiger	A water beetle
	Ilybius subaeneus	A water beetle
?	*Oreodytes davisi*	A water beetle
?	*Rhantus suturalis*	A water beetle
	Stictonectes lepidus	A water beetle
	Cercyon convexiusculus	A scavenger water beetle
	Cercyon tristis	A scavenger water beetle
	Cercyon ustulatus	A scavenger water beetle
	Chaetarthria seminulum	A scavenger water beetle
?	*Georissus crenulatus*	A scavenger water beetle

* Last recorded between 1950 - 1977
\- Last recorded before 1960
\+ Last recorded after 1960
? Date of last record unknown
< Last recorded prior to 1970
> Recorded post 1970

	Helochares lividus	A scavenger water beetle
?	*Helophorus arvernicus*	A scavenger water beetle
	Helophorus fulgidicollis	A scavenger water beetle
	Helophorus griseus	A scavenger water beetle
	Helophorus strigifrons	A scavenger water beetle
*	*Peltodytes caesus*	A crawling water beetle
>	*Abraeus granulum*	A carrion beetle
>	*Gnathoncus buyssoni*	A carrion beetle
<	*Hypocaccus rugiceps*	A carrion beetle
	Hydraena testacea	A small water beetle
?	*Limnebius nitidus*	A small water beetle
?	*Ochthebius bicolon*	A small water beetle
	Ochthebius exsculptus	A small water beetle
	Ochthebius marinus	A small water beetle
*	*Choleva glauca*	A round fungus beetle
<	*Aclypea opaca*	Beet Carrion Beetle
*	*Acidota cruentata*	A rove beetle
*	*Acrolocha minuta*	A rove beetle
<	*Bledius bicornis*	A rove beetle
>	*Lamprinodes saginatus*	A rove beetle
*	*Lathrobium angusticolle*	A rove beetle
*	*Lomechusa emarginata*	A rove beetle
<	*Ocypus nero*	A rove beetle
*	*Paederus fuscipes*	A rove beetle
<	*Philonthus corvinus*	A rove beetle
>	*Phyllodrepa puberula*	A rove beetle
*	*Quedius fulgidus*	A rove beetle
*	*Quedius longicornis*	A rove beetle
*	*Quedius puncticollis*	A rove beetle
>	*Stenus opticus*	A rove beetle
	Amphimallon ochraceus	A dung beetle
<	*Aphodius sordidus*	A dung beetle
	Cetonia cuprea	A dung beetle
<	*Euheptaulacus villosus*	A dung beetle
	Cyphon pubescens	A marsh beetle
<	*Curimopsis setigera*	A pill beetle
<	*Ctenicera pectinicornis*	A click beetle
<	*Fleutiauxellus maritimus*	A click beetle
<	*Fleutiauxellus quadripustulatus*	A click beetle
	Cantharis obscura	A soldier beetle
?	*Anitys rubens*	A wood boring beetle
*	*Meligethes umbrosus*	A pollen beetle
<	*Cyanostolus aeneus*	A narrow bark beetle
<	*Pediacus depressus*	A flat bark beetle
>	*Uleiota planata*	A flat bark beetle
>	*Anommatus duodecimstriatus*	A cerylonid beetle
<	*Anaspis thoracica*	A tumbling flower beetle
*	*Oncomera femorata*	A thick-legged flower beetle
<	*Prionus coriarius*	Sawyer Beetle
<	*Saperda carcharias*	Poplar Borer
<	*Saperda scalaris*	A longhorn beetle
<	*Chrysolina sanguinolenta*	Toadflax Leaf Beetle
	Cryptocephalus bipunctatus	A leaf beetle
	Donacia clavipes	A leaf beetle
<	*Donacia sparganii*	A leaf beetle
<	*Longitarsus nigrofasciatus*	A leaf beetle
<	*Mantura chrysanthemi*	A leaf beetle
<	*Phyllotreta vittata*	A leaf beetle
<	*Pilemostoma fastuosa*	A leaf beetle
<	*Anthribus fasciatus*	A fungus weevil
<	*Choragus sheppardi*	A fungus weevil
<	*Hemitrichapion reflexum*	A seed weevil
<	*Perapion affine*	A seed weevil
<	*Squamapion cineraceum*	A seed weevil
<	*Bagous lutulosus*	A weevil
<	*Ceutorhynchus angulosus*	A weevil
<	*Ceutorhynchus euphorbiae*	A weevil
<	*Ceutorhynchus quercicola*	A weevil
<	*Dorytomus hirtipennis*	A weevil
*	*Grypus equiseti*	Horsetail Weevil
<	*Gymnetron collinum*	A weevil
<	*Gymnetron linariae*	A weevil
<	*Isochnus foliorum*	A weevil
<	*Limobius borealis*	A weevil
*	*Notaris scirpi*	Bulrush Weevil
<	*Omiamima mollina*	A weevil
	Trachodes hispidus	A weevil
>	*Dryocoetinus alni*	A bark beetle
>	*Trypophloeus asperatus*	A bark beetle

Caddisflies *(Trichoptera)*

>	*Rhyacophila septentrionis*	A caddisfly
	Plectrocnemia brevis	A caddisfly
>	*Phacopteryx brevipennis*	A caddisfly

True Flies *(Diptera)*

*	*Cheilotrichia imbuta*	A cranefly
*	*Dactylolabis sexmaculata*	A cranefly
?	*Dactylolabis transversa*	A cranefly
	Dicranota robusta	A cranefly
*	*Diogma glabrata*	A cranefly

* Last recorded between 1950 - 1977
\- Last recorded before 1960
\+ Last recorded after 1960
? Date of last record unknown
< Last recorded prior to 1970
> Recorded post 1970

-	*Limnophila glabricula*	A cranefly
	Limnophila pulchella	A cranefly
	Limnophila trimaculata	A cranefly
?	*Limonia lucida*	A cranefly
?	*Limonia occidua*	A cranefly
*	*Limonia trivittata*	A cranefly
*	*Molophilus bihamatus*	A cranefly
*	*Molophilus niger*	A cranefly
?	*Neolimnophila carteri*	A cranefly
*	*Nephrotoma dorsalis*	A cranefly
?	*Nephrotoma lunulicornis*	A cranefly
?	*Orimarga juvenilis*	A cranefly
*	*Thaumastoptera calceata*	A cranefly
-	*Tipula truncorum*	A cranefly
	Dixella attica	A meniscus midge
	Beris clavipes	A soldier fly
*	*Beris fuscipes*	A soldier fly
?	*Oxycera morrisii*	A soldier fly
	Oxycera pygmaea	A soldier fly
*	*Stratiomys potamida*	A soldier fly
-	*Zabrachia minutissima*	A soldier fly
?	*Ptiolina atra*	A bee fly
	Dioctria oelandica	A robber fly
	Brachyopa insensilis	A hoverfly
	Brachyopa scutellaris	A hoverfly
	Brachypalpus laphriformis	A hoverfly
	Cheilosia pubera	A hoverfly
	Cheilosia soror	A hoverfly
	Chrysogaster macquarti	A hoverfly
	Criorhina asilica	A hoverfly
	Criorhina ranunculi	A hoverfly
	Didea fasciata	A hoverfly
	Eristalis rupium	A hoverfly
	Eumerus ornatus	A hoverfly
?	*Megasyrphus annulipes*	A hoverfly
?	*Melangyna barbifrons*	A hoverfly
	Melangyna triangulifera	A hoverfly
	Metasyrphus latilunulatus	A hoverfly
	Microdon mutabilis	A hoverfly
	Neoascia obliqua	A hoverfly
	Neoascia geniculata	A hoverfly
?	*Neocnemodon latitarsis*	A hoverfly
-	*Neocnemodon verrucula*	A hoverfly
	Orthonevra brevicornis	A hoverfly
	Orthonevra geniculata	A hoverfly
	Platycheirus discimanus	A hoverfly
	Platycheirus immarginatus	A hoverfly
	Platycheirus perpallidus	A hoverfly
	Platycheirus podagratus	A hoverfly
	Platycheirus sticticus	A hoverfly
	Sphegina verecunda	A hoverfly
*	*Xylota abiens*	A hoverfly
	Xylota coeruleiventris	A hoverfly
	Xylota florum	A hoverfly
?	*Conops strigata*	A fly
	Melieria cana	A fly
*	*Tetanocera phyllophora*	A snail-killing fly
	Geomyza majuscla	A fly

Bees and Wasps *(Hymenoptera)*

?	*Cleptes nitidulus*	A ruby-tailed wasp
?	*Cleptes semiauratus*	A ruby-tailed wasp
?	*Hedychridium cupreum*	A ruby-tailed wasp
?	*Priocnemis schioedtei*	A spider-hunting wasp
?	*Podalonia hirsuta*	Hairy Sand Wasp
	Ectemnius ruficornis	A solitary wasp
?	*Pemphredon morio*	A solitary wasp
	Andrena humilis	A mining bee
	Stelis punctulatissima	A cuckoo bee

INVERTEBRATES OTHER THAN INSECTS

Crustaceans *(Crustacea)*

*	*Scapholeberis aurita*	A water flea
	Armadillidium pulchellum	A pill woodlouse
*	*Trichoniscoides saeroeensis*	A woodlouse

Spiders *(Arachnida)*

	Arctosa cinerea	A wolf spider
+	*Argenna patula*	A mesh webbed spider
	Rugathodes bellicosus	A comb-footed spider
*	*Tetragnatha striata*	A long-jawed spider
+	*Lepthyphantes insignis*	A money spider
	Mecopisthes peusi	A money spider
+	*Mioxena blanda*	A money spider
	Satilatlas britteni	A money spider
	Walckenaeria incisa	A money spider

* Last recorded between 1950 - 1977
\- Last recorded before 1960
\+ Last recorded after 1960
? Date of last record unknown
< Last recorded prior to 1970
> Recorded post 1970

Justification

Nationally scarce species occur only in 16-100 10km squares (inclusive) in Britain; their conservation is a matter of national concern.

In3 Any site which regularly supports a population of an invertebrate species which is recorded from three or fewer localities in Lancashire not included under any other guideline.

Application

Any site in this category may be considered for inclusion. However, systematically obtained recent information on these groups of animals is insufficiently advanced for relevant species to be listed. However, the following species is believed to satisfy the terms of the guidlines:

INVERTEBRATES OTHER THAN INSECTS

Moss Animals *(Bryozoa)*

Plumatella fungosa	A moss animal

In4 Any site which regularly supports a significant proportion of the Lancashire population, or contributes significantly to the range in Lancashire, of an invertebrate species which is recorded from more than three localities in the County, but which could be at risk because of very small populations, recent rapid decline or habitat loss or change, and which is not included under any other guideline.

Application

It is considered that recent systematic recording of the animal groups concerned is insufficiently advanced to allow the application of this guideline.

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Glossary

The following terms are used to refer to the groups involved in system development and maintenance and the various forms in which data relating to Biological Heritage Sites is provided.

Biological Heritage Sites Working Group

This Group was responsible for the development of the BHS Guidelines for Site Selection and the initial confirmation of BHS. It comprised experienced professional ecologists from Lancashire County Council Planning Department, Lancashire Wildlife Trust and English Nature (North West), including the contract officers (responsible for preliminary site selection and boundary evaluation), working in conjunction with national and local specialists and honorary conservation officers of the Lancashire Wildlife Trust.

Biological Heritage Sites Project Steering Group

The BHS Project is a partnership between Lancashire County Council, Lancashire Wildlife Trust and English Nature (North West) working with district councils in Lancashire. The project is supported by the Worldwide Fund for Nature.

The Project aims to promote the sound stewardship of BHS. It seeks to achieve this through co-operation with site owners and managers and employs Project Officers to this end. This Project Steering Group oversees the work of the Project Officers and identifies priorities for future action.

Biological Heritage Sites Review Panel

This Panel has taken over the responsibility for the management and review of the BHS Register and the BHS Guidelines for Site Selection. It meets annually (usually in November). It comprises experienced professional ecologists from Lancashire County Council Planning Department, Lancashire Wildlife Trust and English Nature (North West), including the BHS Project Officers, working in conjunction with national and local specialists.

Site Record

The Site Record consists of all information relating to a single BHS.

Composite Site Boundary Plans

There are two sets of Composite Site Boundary Plans covering the whole County:

a) 1:10,000 scale Ordnance Survey sheets depicting the boundaries of all BHS which lie, in whole or part, within the area depicted. Each site is labelled with a reference number.

b) 1:50,000 scale Odnance Survey sheets depicting the boundaries of all BHS which lie, in whole or part, within the area depicted.

Summary Listings

Summary site details are listed in three forms:

County Summary Listing

A listing of summary details for all the BHS within the County of Lancashire. The summary details comprise: Site Reference, Site Name, District, Grid Reference, Guideline(s).

District Summary Listings

A listing of summary details for all the BHS within each of the 14 constituent districts within the County of Lancashire. The summary details comprise: 10km Square/Site Reference, Site Name, Grid Reference, Guideline(s).

Site Summary Listings

The summary details for an individual site as they appear in the County Summary Listing or District Summary Listings.

Site Information Form

This provides summary details, for a single site, including the details contained in the Site Summary Listing together with a summary site description and additional information.

Site Boundary Plan

This shows summary details, for a single site, including the site name, central grid reference and site boundary map usually at 1:10,000 scale. More than one plan may be required for larger sites.

Appendix 1

Landscape Zones and Landscape Character Tracts