Guidelines for selection of County Wildlife Sites in Cumbria

18 July 2008

County Wildlife Sites System administered by
Cumbria Wildlife Trust on behalf of Cumbria Local Sites Partnership

FOREWORD

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In the sixty years since nature conservation first gained statutory approval with the passage of the National Parks and Access to the Countryside Act, 1949, the protection of wildlife habitats has changed dramatically. National Nature Reserves and Sites of Special Scientific Interest now enjoy a measure of statutory protection undreamed of in the beginning. Many outstanding locations are now designated under European legislation and international Conventions. But it has become clear that we will not safeguard our heritage of wildlife unless we look beyond these 'jewels in the crown'.

County Wildlife Sites are the gold that links the jewels. They are key habitats within the countryside, places which have a rich diversity and provide refuges for a great variety of species.

Today's uncertainties make the work of survey, identification and designation of these sites especially important. We expect the climate to change, and we know that human pressures on the environment are not diminishing. County Wildlife Sites are both places where plants and animals can survive and potential 'stepping stones' across which they can disperse to new locations. While we need to make the whole county a 'living landscape' the County Wildlife Sites are the nodes of greatest richness.

We all share a responsibility to hand a diverse and beautiful environment on to future generations. The recent Natural Environment and Rural Communities Act has formally enshrined that duty in the mandate of all public bodies. The creation of an effective Wildlife Sites system is one expression of that responsibility, to be achieved through continuing partnership between the statutory and voluntary organisations concerned with conservation.

These new Guidelines provide part of the framework for this joint action. While no working document like this can ever be the last word, I am confident that it will guide us to sound judgement in Cumbria and so contribute to the conservation of our precious natural heritage. I congratulate its authors and thank them for what they have done.

Martin Holdgate July 2008

ACKNOWLEDGEMENTS

These guidelines have drawn heavily on the work of Lancashire County Council ecologists and their pioneering guidelines for Biological Heritage Sites. We have also taken inspiration from sections of North Yorkshire's[1] and Derbyshire's[2] selection guidelines and Cambridgeshire and Peterborough's County Wildlife Site System Handbook[3] and are indebted to them all.

As part of the drafting process a number of specialists were invited to workshops and we are indebted to Jane Lusardi (Natural England), Liz Dawson (Environment Agency) and Claire Cornish who provided advice on rivers, lakes and tarns; Simon Stainer and Jean Johnson (both from Natural England) in relation to upland habitats; Steve Hewitt (Tullie House Museum), Corrie Bruemmer (Natural England) and Tony Marshall (Marshall Ecology) for mammals, reptiles, amphibians and invertebrates; and Dave Shackleton and Tim Youngs of RSPB for birds. Ron Porley (Natural England) and Rod Corner also commented on early drafts of the lower plant guidelines.

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[1] North Yorkshire SINC Panel. 2006. Sites of Importance for Nature Conservation in North Yorkshire: Guidelines for Site Selection.

[2] Derbyshire Wildlife Trust. 2005. Derbyshire Wildlife Sites Handbook Volumes 1 and 2.

[3] Cambridgeshire and Peterborough County Wildlife Sites Partnership. 2007. Cambridgeshire and Peterborough County Wildlife Site System Handbook. May 2007 Draft.

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INTRODUCTION

WHAT ARE CUMBRIA COUNTY WILDLIFE SITES?

Cumbria County Wildlife Sites are areas identified and selected locally for their nature conservation value. This is defined by the presence of important, distinctive and threatened habitats and species. They do not include areas of sub-tidal marine habitat.

County Wildlife Sites can be found on both public and private land. They vary in shape and size and may encompass a variety of different habitat types such as ancient woodland, species-rich grasslands, wetlands, roadside verges and hedgerows. The habitats and species present are often there because of past management.

These sites play a vital role in the conservation of the UK's natural heritage by providing essential wildlife refuges, stepping-stones, corridors and buffers linking and protecting other designated sites and open spaces both in towns and the wider countryside.

Cumbria County Wildlife Sites are part of the hierarchy of nature conservation site designations present in the UK. (outlined in Table 1). Together with Cumbria Local Geological Sites they form *Local Sites* in the Local Development Framework context and comprise the most important biological sites outside statutorily protected nature conservation sites. The Cumbria County Wildlife Site System is intended to be comprehensive. All sites meeting the Cumbria County Wildlife Site selection criteria are selected. As a result some Cumbria County Wildlife Sites may be of similar quality to SSSIs.

Table 1 Nature conservation designations in the UK

Designation	Explanation
Sites of International Importance	
Ramsar Sites	These sites are listed under the Convention on Wetlands of International Importance (Ramsar Convention). They are also designated as SSSIs.
Special Protection Areas (SPAs)	These sites are designated as SPA under the EC Directive on the Conservation of Wild Birds. They are also designated as SSSIs.
Special Areas of Conservation (SACs)	These sites are designated as SAC under the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora. They are also designated as SSSIs.
Sites of National Importance	
National Nature Reserves (NNRs)	These sites are SSSIs and declared as NNRs under the National Parks and Access to the Countryside Act 1949 or under section 35 of the Wildlife and Countryside Act 1981 as amended.
Sites of Special Scientific Interest (SSSIs)	These sites are designated under section 28 of the Wildlife and Countryside Act 1981 as amended.

Table 1 Nature conservation designations in the UK

Designation	Explanation
Sites of Regional and local Importance	
Local Nature Reserves (LNRs)	These sites are declared by Local Authorities under Section 21 of the National Parks and Access to the Countryside Act 1949 and may have either wildlife or geological interest and be capable of being managed with the conservation of nature and/or the maintenance of special opportunities for study, research or enjoyment of nature as the priority concern.
Local Sites	
Cumbria Local Geological Sites	These are locally and regionally important earth science sites selected by local Regionally Important Geological and Geomorphological Sites (RIGS) Groups using both national and local criteria.
Cumbria County Wildlife Sites	These are locally and regionally important wildlife sites selected by local (usually County) selection panels using locally developed criteria.

THE HISTORY OF WILDLIFE SITES IN CUMBRIA

Cumbria's County Wildlife Sites were first created in the 1970s as a dossier of sites identified by staff and members of the Cumbria Trust for Nature Conservation (CTNC, now Cumbria Wildlife Trust) as being of wildlife interest. No criteria existed for defining this interest and the sites included were of varying quality and were only initially recognised by Barrow Borough Council in their Local Plan. In the early 1980s the Nature Conservancy Council undertook a Phase One Habitat Survey of Cumbria which mapped the vegetation across the whole of Cumbria. As part of this survey the information on sites in the CTNC dossier was collated and checked in the field[4]. The information from the Phase One Habitat Survey of Cumbria was then used to create a refined and extended list of sites which were considered to support good examples of habitats or were botanically rich. For the most part the Phase One Habitat Survey did not extend to faunal surveys, other than for casual records. Therefore these refined lists did not generally include sites of importance for their faunal interest, unless this had been identified in the original CTNC dossier.

In the late 1980s it was realised that if the list of County Wildlife Sites was to be used more widely in the planning process then a more rigorous selection procedure was required. The County Wildlife Sites Panel was established (consisting of Cumbria Wildlife Trust, Natural England, Lake District National Park, Cumbria County Council, National Trust, Environment Agency and Tullie House Museum), a set of selection guidelines was drawn up, and a review of all County Wildlife Sites started, involving field survey of all sites on the list district by district. Due to the very large number of sites involved (over 1,600, reflecting the great wealth of wildlife interest in the county) and financial constraints this process is still in progress. The vast majority of known sites outside the Lake District and Yorkshire Dales National Parks have now been reviewed and work is in progress to review sites within the National Parks.

In addition to reviewing existing Cumbria County Wildlife Sites the Site Selection Panel also considers new sites which come to light for inclusion in the Wildlife Site system. However, restrictions of time and funding also mean that many possible new sites that qualify under the guidelines have yet to be surveyed. Prior to this

[4] Kelly, P G and Perry, K A. 1990. Wildlife Habitat in Cumbria. Research and Survey in Nature Conservation No. 30. Nature Conservancy Council. Peterborough.

review of the Wildlife Site Selection Guidelines the most recent version of the Site Selection Guidelines dates from 2002[5].

Certain types of site, for example rivers, uplands, coastal and many species groups are currently underrepresented or absent from the system. It is envisaged that the system will be extended to cover these gaps following the publication of this review of the selection guidelines.

LEGISLATIVE AND POLICY CONTEXT

TREATMENT OF CUMBRIA COUNTY WILDLIFE SITES WITHIN THE PLANNING SYSTEM

Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9) provides a statement of national planning policy for biodiversity and geological conservation in England. It recognises that Local Sites have a fundamental role to play in helping to meet overall national biodiversity targets, contributing to the quality of life and the well-being of the community, and supporting research and education.

The policies set out in PPS9 need to be taken into account by regional planning bodies and by local planning authorities in the preparation of local development documents. PPS9 sets out a series of key principles to ensure that the impacts of planning decisions on biodiversity are fully considered. It also advises that Local Development Frameworks (LDFs) should indicate the location of designated sites of importance for biodiversity and geodiversity on proposals maps, including regional and locally designated sites. Criteria based policies should be established showing how proposals for any development on, or affecting such sites, will be judged. This is supported by Planning Policy Statement 12: Local Development Frameworks.

The adopted Structure Plan[6] prepared by the County Council and Lake District National Park Authority is the current strategic framework for development control and a framework for local plans providing protection of the wider countryside through policy E35 *Areas and Features of nature conservation interests other than those of national and international conservation importance*. This document will soon be replaced by the Regional Spatial Strategy for the North West[7] (RSS) for the region. The recommended wording for Policy EM1 of the RSS refers directly to Cumbria County Wildlife Sites and promotes biodiversity enhancement, stating that "*Plans, strategies, proposals and schemes should seek to deliver a 'step-change' increase in the region's biodiversity resources by contributing to the delivery of national, regional and local biodiversity objectives and targets for maintaining, restoring and expanding habitats and species populations. This should be done through protecting, enhancing, expanding and linking areas for wildlife within and between the locations of highest biodiversity resources, including statutory and local wildlife sites, and encouraging the conservation and expansion of the ecological fabric elsewhere.*"

A DUTY TO CONSERVE BIODIVERSITY

Under Section 74 of the Countryside and Rights of Way Act 2000 every minister and Government department has a duty to have regard to the purpose of the conservation of biological diversity in the exercise of its functions; and to take, or promote the taking by others, of steps to further the conservation of the habitats and species which together are of principal importance for the conservation of biodiversity. In addition to this PPS9 states that local authorities and other public bodies should conserve habitats of principal importance and identify opportunities to enhance and add to them.

[5] Cumbria Wildlife Trust. 2002. Provisional guidelines for the selection of wildlife sites in Cumbria.

[6] Cumbria County Council and Lake District National Park Authority. 2006. Cumbria and Lake District Joint Structure Plan 2001 – 2016 Adopted Plan, April 2006.

[7] Government Office for the North West. 2006. Draft Submitted RSS for North West England; and GONW. 2007. North West Draft Regional Spatial Strategy Examination in Public: Report of the Panel.

Section 40 of the Natural Environment and Rural Communities Act 2006 reinforces and extends this duty to conserve biodiversity to all public authorities: "*Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.*" *Public authorities* here include not only Ministers of the Crown and government departments, but also public bodies such as local authorities, local planning authorities and statutory undertakers. Local authorities includes not only County and District councils, but also Parish councils.

THE BIODIVERSITY STRATEGY FOR ENGLAND

The Biodiversity Strategy for England is the principal means by which Government in England discharges the Section 74 duties referred to above, and this includes the promotion of a more consistent approach to the operation of Local Sites systems[8, 9 & 10].

The UK Biodiversity Action Plan (BAP) was published in January 1994 in response to Article 6 of the 1992 UN Convention on Biological Diversity, to develop national strategies for the conservation of biological diversity and the sustainable use of biological resources. Following this some 391 species and 45 habitat action plans have been published at the UK level and are currently being implemented. In 2007 a review of the UK BAP[11] produced a revised and amended list of UK Priority species and habitats containing 1149 species and 65 habitats viewed as priorities for conservation action.

It was recognised early on that successful implementation of the UK Biodiversity Action Plan required some means of ensuring that the national strategy was translated into effective action at the local level and Local Biodiversity Action Plans are seen as the means by which this can be achieved. The Cumbria Biodiversity Action Plan has 39 Species and Habitat Action Plans designed to conserve and/or enhance a range of threatened species and habitats of both local and national importance. The Species and Habitat Action Plans comprising the Cumbria Biodiversity Action Plan are available on line at the Cumbria BAP website[12], which also provides further information on the biodiversity process and the Cumbria Biodiversity Partnership. The DETR circular on the Countryside and Rights of Way Act 2000[13] makes clear that Local Sites are important components within Local Biodiversity Action Plans.

THE EU HABITATS DIRECTIVE

Article 10 of the EU Habitats Directive says that: *"Member states shall endeavour, where they consider it necessary, in their land use planning and development policies, and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild flora and fauna."*

This has been transposed into UK law in regulation 37 of the Habitats Regulations 1994: *"For the purposes of the planning enactments…policies in respect of the conservation of the natural beauty and amenity of the land shall be taken to include policies encouraging the management of features of the landscape which are of major importance for wild flora and fauna*.

[8] Defra. 2002. Working with the grain of nature – a biodiversity strategy for England.

[9] Defra. 2006. Local Sites. Guidance on their Identification, Selection and Management.

[10] Defra. 2007. Conserving Biodiversity – The UK Approach.

[11] Biodiversity Reporting and Information Group. 2007. Report on the Species and Habitat Review. Report to the UK Biodiversity Partnership. (http://www.ukbap.org.uk/bapgrouppage.aspx?id=112)

[12] http://www.wildlifeincumbria.org.uk/cbap/habitat_biodiversity.asp

[13] DETR. 2001. Countryside Rights of Way act 2000. DETR Circular 04/2001.

Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species".

The resultant planning policies, referred to as "Regulation 37 policies", should be included in land use plans or spatial strategies. Local sites systems contribute to fulfilling this requirement and can play a very important part in maintaining the links that join up and support the nationally and internationally recognised sites.

NATIONAL INDICATOR 197

In 2007 as part of the Comprehensive Spending Review a new set of national indicators for English local authorities and local authority partnerships was drawn up. This list of indicators derives from the priorities identified in the Public Services Agreements and Departmental Strategic Objectives in the 2007 Comprehensive Spending Review. National Indicator 197 (*Improved Local Biodiversity – proportion of Local Sites where positive conservation management has been or is being implemented*) relates to the Defra Departmental Strategic Objective: *A healthy, resilient, productive and diverse natural environment*[14]. NI 197 is to be included as one of the indicators within Cumbria's 2008 - 2011 Local Area Agreement[15].

Following this adoption of National Indicator 197 in Cumbria the Cumbria Local Sites Partnership has been established to coordinate the designation and monitoring of Local Sites (which comprise both County Wildlife Sites and RIGS) in Cumbria.

CLIMATE CHANGE

The conservation of high quality habitats and the range and ecological variability of habitats and species has been highlighted as being key to the conservation of biodiversity in the light of climate change. In addition it is crucial to preserve and enhance ecologically resilient and varied landscapes and establish ecological networks[16]. A summary of the guiding principles that should be taken into account in implementing any biodiversity plans or projects is set out below.

One of the most important factors which is likely to affect the capacity of species to survive climate change maybe the impact of habitat fragmentation on their ability to disperse. Many species of conservation concern occur in patches which are separated from each other by distances greater than the normal dispersal capacities of those species. Other species may currently be able to disperse between habitat patches, but may not be able to do so in future if areas of existing habitat are lost. Moreover, projections of the likely effects of climate change imply a shift of hundreds of kilometres latitudinally or hundreds of metres altitudinally in the limits of tolerance of species and at rates that outstrip the dispersal capacity of most species.

The Cumbria County Wildlife Site network is vital for the preservation of habitat patches. Cumbria County Wildlife Sites in conjunction with nature reserves and SSSIs provide a framework of stepping stones for species dispersal and loci for future habitat creation initiatives where these are needed to enable species to survive. The comprehensive nature of the Cumbria County Wildlife Sites network is important in the preservation of the full geographic range of species and the full range of ecological situations in which they occur.

[14] Department for Communities and Local Government. 2008. National Indicators for Local Authorities and Local Authority Partnerships: Handbook of Definitions.

[15] Cumbria Strategic Partnership. 2008. A Local Area Agreement for Cumbria 2008 – 2011. Draft. Submission to Government Office North West. 4th April 2008.

[16] Hopkins, J J, Allison, H M, Walmsley, C A, Gaywood, M and Thurgate, G. 2007. Conserving biodiversity in a changing climate: guidance on building capacity to adapt. Defra.

The following provides a summary of Hopkins *et al*. (2007)'s Guiding Principles:

1 Conserve existing biodiversity

The richness of future biodiversity, in a changing world, will depend upon the diversity we conserve today.

1a Conserve Protected Areas and other high quality habitats

These areas will remain important because they have characteristics which will continue to favour high biodiversity: e.g., low-nutrient soils.

1b Conserve range and ecological variability of habitats and species

It is impossible to predict which localities will continue to have climatic conditions suitable for a given species or habitat; by conserving the current range and variability we will reduce the probability of all localities being lost, although some losses will be inevitable.

2 Reduce sources of harm not linked to climate

Climate change is one of many threats to biodiversity and by reducing other sources of harm we will help natural systems maintain their biodiversity in the face of climate change.

3 Develop ecologically resilient and varied landscapes

By ensuring landscapes remain varied, and allowing space for physical processes to take place, we will increase their ability to retain biodiversity.

3a Conserve and enhance local variation within sites and habitats

Maintaining diversity in the landscape in terms of features such as vegetation structure, slope, aspect and water regime will increase the chances that species whose current habitat becomes inhospitable will be able to spread locally into newly favourable habitat.

3b Make space for the natural development of rivers and coasts

Changing rainfall patterns and rising sea levels will affect our rivers and coasts. By allowing natural processes of erosion and deposition to take place we will increase the potential for wildlife to naturally adapt to these changes.

4 Establish ecological networks through habitat protection, restoration and creation

Some species will need to move some distance from their current locality if they are to survive climate change; creating new habitat, restoring degraded habitat, or reducing the intensity of management of some areas between existing habitat, will encourage this.

5 Make sound decisions based on analysis

Adopt an evidence-based approach which recognises that biodiversity is constantly changing.

5a Thoroughly analyse causes of change

Not all change will be due to climate change and by thoroughly analysing the causes of change we will identify those situations where climate-change adaptation is needed.

5b Respond to changing conservation priorities

Regularly review conservation targets to ensure resources are directed towards genuine conservation priorities as some species increase, others decline and habitats change in character.

6 Integrate adaptation and mitigation measures into conservation management, planning and practice

When reviewing conservation management plans consider the impacts of climate change – for example more frequent summer fires and floods – and make changes as appropriate. Where they can be identified, reduce release of greenhouse gases to the atmosphere.

GUIDELINES FOR SELECTION OF CUMBRIA COUNTY WILDLIFE SITES

These guidelines follow the general approach taken by the Lancashire County Heritage Sites Scheme when drawing up their guidelines for Biological Heritage Site selection[17]. The Lancashire Guidelines are based on the SSSI selection guidelines, but apply specifically to Lancashire rather than to the UK as a whole. Likewise the guidelines for Cumbria apply specifically to this county and take into account the very special nature and context of its wildlife.

The selection criteria take into account available information on habitats and species as well as relevant historical and structural aspects. The thresholds contained within the selection criteria are sensitive to local conditions and are a matter of judgement based on a number of factors including an understanding of ecological processes and the distribution, abundance and trends in the wildlife resource. The criteria have been developed to define what qualifies as substantive nature conservation value in a county context.

The guidelines have been kept as brief and as simple as possible and are intended to be self explanatory and stand-alone. 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.

They are grouped according to habitat types and species-groups. For both groups one or more guidelines are given to select the wildlife features considered to be of substantive quality at the county scale. Each guideline defines the selection attribute or attributes considered and a minimum threshold level for each attribute. This is followed by an explanation as to how the guideline should be applied in practice (*Application*) and a brief non-technical statement of the biological justification for its inclusion (*Justification*).

The guidelines have been written by a team of experienced professional ecologists from Cumbria Wildlife Trust, Environment Agency, Natural England and Rigby Jerram Ecological Consultants, assisted by local and national specialists in particular habitat types and species groups.

SELECTION CRITERIA

As with most other modern approaches to site evaluation for wildlife, the guidelines are based on the primary criteria used by Derek Ratcliffe in A Nature Conservation Review[18], as recommended in the Defra Local Sites selection guidance (Defra 2006). The relevant Ratcliffe criteria are outlined in Table 2 and form the basis for the specific habitat and species related minimum standards used in these guidelines. The degree of significance of the attributes varies between different habitat types, and when used in evaluation of sites of county scale significance, lower thresholds than those applying to SSSIs are generally adopted.

The guidelines principally refer habitats to one of two classifications that have widespread acceptance in the ecological community. The National Vegetation Classification (NVC) is most frequently followed, but where the UK Biodiversity Action Plan Priority Habitat description provides a more appropriate or simpler description, this is used instead. The quality of a habitat is generally assessed according to its diversity and against set thresholds, which are based on the numbers of species that are particularly indicative of

[17] Lancashire Biological Heritage Sites Partnership. 1998. Biological Heritage Sites: Guidelines for Site Selection.

[18] Ratcliffe, D.A. 1977. A Nature Conservation Review Volume 1. Cambridge University Press.

naturalness, a lack of agricultural improvement and or longevity of that habitat type. For most habitats a minimum area is also required. The presence of Red Data Book (RDB) species, Nationally Rare, Nationally Scarce, locally scarce or BAP priority species are also taken into account.

Table 2 The Ratcliffe Criteria

Size	The importance and value of a site generally increases with its size, allowing it to support both more species and larger populations of those species. Larger sites are also more robust and less sensitive to minor perturbations and external influences.
Rarity	The local loss of a rare species or habitat may result directly in the reduction in its wider geographical range. For species that are rare, local populations may represent an important part of the total species gene pool. The loss of a local population may result in the irreversible loss of genetic diversity, local races or subspecies and ultimately of species themselves.
Diversity	A key principle of nature conservation is to sustain the diversity of species and habitats. Whilst some habitats are characteristically more species-rich than others, each habitat type is characterised by its own range of species. Generally the more diverse a site is in terms of species then the greater the nature conservation value, however this may not be the case where a large number of species typical of disturbed sites are present within a normally stable habitat type.
Naturalness	Assessment of the closeness of a habitat to its form unmodified by human influence. As elsewhere in Britain, all terrestrial habitats have been modified to varying extents. In many cases, therefore, this characteristic seeks to relate a site to its state under traditional management.
Typicalness	Generally, Local Sites will not be typical of the landscapes in which they are found; their designation is likely to reflect the fact that they are special in some way. Rather, their value lies in them exemplifying a type of habitat, geological feature, or a population of a species, that is characteristic of the natural components of the landscape in which they are found.
Fragility	All sites are sensitive to environmental change, but some are more sensitive to change than others. For example, some invertebrates require grasslands with short open turf with a good proportion of exposed soil. The cessation, or even the reduction in the intensity of grazing, could lead to the loss of species in relatively short periods of time. Similarly many sites such as peatlands are susceptible to erosion and damage from trampling and unmanaged access. Active conservation management is important in maintaining the condition of sites, countering adverse impacts and preventing the loss of ephemeral populations and habitats through successional change.

APPLICATION OF THE GUIDELINES

Any area of land or water which satisfies one or more of the guidelines is eligible for inclusion in the list of County Wildlife Sites. Sites should generally be evaluated on the basis of reliable information obtained no more than five years prior to site selection.

The list of sites selected will not include any Sites of Special Scientific Interest, except for geological SSSIs whose biological interest satisfies these guidelines but does not form any part of the basis for the SSSI notification. Statutory Local Nature Reserves however are eligible for selection provided that they meet one or more of the guidelines.

DETERMINATION OF BOUNDARIES

Once a site has been assessed as being of County Wildlife Site quality, careful consideration should be given to the identification of the boundaries of the designation. Care must be taken not to undermine the rigour of the County Wildlife Sites System by including significant areas of land that do not meet the selection guidelines. However it may be necessary for the future viability of a site to include habitat that is of lesser value.

When determining County Wildlife Site (CWS) boundaries:

1. As a general rule, at least 50% of the area of a CWS should consist of land which qualifies under the guidelines.

2. The justification for the definition of the boundary must be clearly recorded.

3. A CWS may include areas of several habitats, each of which qualifies under different criteria.

4. Wherever possible a CWS should consist of readily identifiable management units with clear physical boundaries e.g. a field, a woodland, a roadside verge.

5. Where there are several qualifying management units adjacent to each other, for example a group of meadows, a single site boundary should be drawn around all of them.

6. Where there are several qualifying management units of the same general habitat type (e.g. grassland) that are not adjacent, but in close proximity to each other, these may be defined by separate boundaries but designated as a single CWS.

7. If less than 50% of a management unit qualifies under the guidelines, or where the qualifying habitat does not fall within a traditional management unit (e.g. industrial land) it may be appropriate to designate only the area of interest. In this case a boundary may be drawn which does not follow a physical boundary such as a wall or hedge, but relates to visible features (e.g. a straight line between two clearly defined landmarks or topographical features). Generally the use of habitat or vegetation boundaries as site boundaries is not recommended as these can move or become indistinct with the passage of time.

8. Where a feature meeting a guideline is surrounded by non-qualifying habitat and there are no readily definable ecological boundaries then consideration should be given to the use of a buffer zone extending 20 to 50 metres beyond the limit of the qualifying habitat so as to reduce the risk of damage to the site resulting from confusion as to the precise position of the site boundary. This situation is most likely to be relevant where springs and flushes, tarns, gills, crags or other small or isolated habitats are present in areas of degraded upland habitat such as acid grassland, but may be applicable to other intrinsically small features which meet the selection guidelines.

9. For unenclosed fell or moor the boundary of the unenclosed land should normally be used as the boundary of upland CWSs, even where this results in some inferior habitats being included. This may mean that in some circumstances less than 50% of the site consists of land which qualifies under the guidelines.

10. For wetland CWSs, where water supply and quality are vital to maintaining their ecological interest, the boundary may be drawn to follow a catchment boundary or include an appropriate hydrologically linked buffer zone.

11. Where a CWS is designated for a species, or group of species, which requires a different habitat at different stages of its life cycle (or at different times of year) the boundary should be drawn to include all of these habitats if they are adjacent or in close proximity to each other. For more mobile species such as birds, an area important for only part of the lifecycle/year may be designated.

12. Specific guidelines for determining the boundaries of riverine wildlife sites are given in the Freshwater and Fish Guidelines.

SPECIES GUIDELINES

Where sites are selected solely on the basis of the presence of one or more species the designation should be based on reliable records. For some groups this will require specialist skills and wherever possible the identity of species of county or greater rarity should be confirmed by a recognised expert. Species data must also be relatively up to date and the term *regularly* has been used in the guidelines to indicate that the species should have been recorded for a minimum of 3 years (not necessarily consecutively) out of the 5 years preceding designation. However, in some cases sites may be selected 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.

Species guidelines apply only to species which occur naturally in Cumbria. These include:

- species known or believed to be historically native to Cumbria;
- species which are native to Great Britain and are established recent colonists (within the last 100 years) in Cumbria without the benefit of deliberate introduction or assistance;
- species which have been re-introduced as part of a recognised strategy for their conservation such as a Natural England Species Recovery Programme.

Species excluded include:

- species known or believed to have been deliberately introduced into Cumbria except those covered by Species Recovery Programmes or the like;
- colonists which are unlikely to persist in the wild without deliberate human intervention.

Wherever possible a standard approach has been used for site selection on the grounds of the presence of species, based on a combination of rarity and threat as defined below. However wide variations from one species group to another in terms of the quantity and quality of the data available mean that the way the approach is applied in practice also varies. Guidelines for some vertebrate groups (e.g. amphibians and birds), whilst influenced by this basic approach, also make use of the results of other detailed studies and established methods specific to those groups and consequently appear in a rather different format.

It should be noted that the existence of legal protection for a species is not used as a reason for site selection.

DEFINITIONS OF SPECIES RARITY AND THREAT STATUS

The Joint Nature Conservation Committee (JNCC) Species Status Assessment project aims to rationalise the process of assessing conservation status so that all taxonomic groups are assessed to a comparable standard across Great Britain. It replaces both the wide variety of definitions of species conservation status (how threatened they are) that have been used over the past few decades and the various Red Lists and Biodiversity Lists which currently exist. The basis of the JNCC's assessment of species status are the 2001 IUCN (World Conservation Union) criteria and threat categories[19] plus the UK *Nationally Scarce* category. Data from the species status assessment is compiled into the JNCC Species of Conservation Concern (SoCC) list.

[19] IUCN. (2001). IUCN Red List Categories and Criteria: Version 3.1. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK. (http://intranet.iucn.org/webfiles/doc/SSC/RedList/redlistcatsenglish.pdf)

For the purposes of selecting Cumbria County Wildlife Sites for threatened and rare species two types of category are used:

- Threat categories, using the JNCC Species of Conservation Concern List which is based upon the IUCN 2001 criteria,
- Rarity categories, using frequency of occurrence in either hectads (10 x 10km squares) or tetrads (2 x 2km squares).

The two types of category are independent of each other.

THREAT CATEGORIES

The IUCN has six *threat* categories, plus two *extinct* categories and two categories for species whose status has not been, or cannot be, assessed. The relationship between these categories is shown in Figure 1, whilst the IUCN definitions are shown in Table 3. This table also shows how these categories are treated in the selection guidelines. Three tiers of IUCN threat category: Threatened, Near Threatened and Least Concern are used in the selection guidelines. These evaluate threat at the UK scale since current knowledge does not allow this to be done at the county scale in Cumbria.

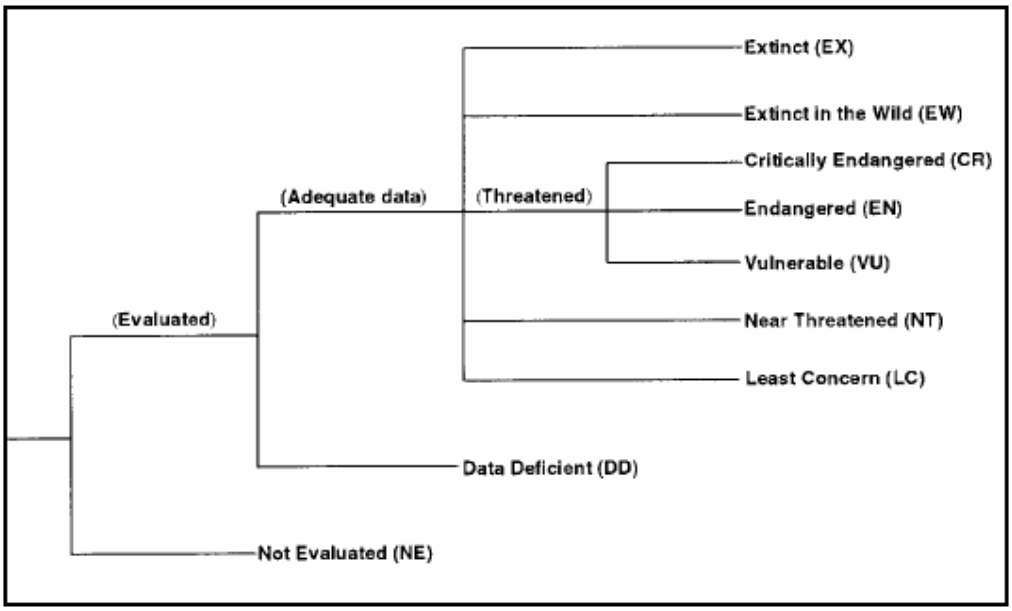

Figure 1 Relationship between IUCN categories (source: IUCN, 2001)

Table 3 Definitions of IUCN threat categories (IUCN 2001)*

IUCN threat category	Definition of taxon	Status in Cumbria Guidelines
Extinct (EX)	A taxon is *Extinct* when there is no reasonable doubt that the last individual has died.	Not covered by selection guidelines
Extinct in the Wild (EW)	A taxon is *Extinct in the Wild* when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range.	

Table 3 Definitions of IUCN threat categories (IUCN 2001)*

IUCN threat category	Definition of taxon	Status in Cumbria Guidelines
Critically Endangered (CR)	A taxon is *Critically Endangered* when it is considered to be facing an **extremely high risk of extinction** in the wild.	Threatened (Red List) Sites for these species selected under Sp1
Endangered (EN)	A taxon is *Endangered* when it is considered to be facing a **very high risk of extinction** in the wild.	
Vulnerable (VU)	A taxon is *Vulnerable* when it is considered to be facing a **high risk of extinction** in the wild.	
Near Threatened (NT)	A taxon is *Near Threatened* when it does not qualify for *Critically Endangered, Endangered* or *Vulnerable* now, but is close to qualifying for, or is likely to qualify for, a threatened category in the near future without ongoing conservation measures.	Near Threatened Sites for these species selected under Sp3 (See below)
Least Concern (LC)	A taxon is L*east Concern* when it has been evaluated against the criteria and does not qualify for *Critically Endangered, Endangered, Vulnerable* or *Near Threatened*. Widespread and abundant taxa are included in this category.	Least Concern No selection guidelines required unless species falls into a national or Cumbrian rarity category
Data Deficient (DD)	A taxon is *Data Deficient* when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.	Not covered by selection guidelines, but it is recognised that species in this category may be covered by a threat or rarity category once data is available
Not Evaluated (NE)	A taxon is *Not Evaluated* when it is has not yet been evaluated against the criteria.	Not covered by selection guidelines

* For full details of criteria see the IUCN website at http://www.iucn.org

NEAR THREATENED CATEGORY

JNCC is in the process of formulating its own definition of the *Near Threatened* category and it is this which should be used for site selection once it is finalised, however until this happens the IUCN definition given in Table 3 will be used.

The JNCC *Near Threatened* category will include[20]:

- All species in 1-15 hectads (10 km squares) not in the Red List.
- All species that have declined/are declining severely, but are not yet on the Red List.

[20] JNCC website: http://www.jncc.gov.uk/page-1775

- A subset of the species now listed as *Nationally Scarce* that are genuinely rare but not in the Red List or listed as *Near Threatened*.

UK BAP PRIORITY SPECIES

In addition to the IUCN threat categories, species listed as priority species by the UK Biodiversity Partnership are included in the threat category. A review of the UK BAP Priority Species List was published in June 2007 and it is this list which is used for selection purposes until it is updated[21]. Annex 3 of this review provides definitions of the criteria used by the UK Biodiversity Partnership for selecting the list of UK priority species.

RARITY CATEGORIES

RARE

Any species occurring in 15 or fewer hectads. Usage of the term 'rare' has been discontinued by JNCC for the purposes of Species Status Assessment, however as not all taxa are currently assessed using the new definitions its use is retained for the purposes of these guidelines until this is no longer true. Many of the species in the old *Rare* category are now in the *Near Threatened* category.

NATIONALLY SCARCE

Any species occurring in 16-100 hectads throughout GB. This category includes the old Invertebrate Site Register categories of:

'Notable A' = recorded from 30 or fewer hectads

'Notable B' = recorded from 31-100 hectads.

CUMBRIAN RARITY

A Cumbrian rare species is defined as one recorded from 10 or fewer tetrads in the county. Ten or fewer tetrads is the equivalent proportion of tetrads in Cumbria to the proportion of hectads used to define rare in the national context (15 or fewer, 0.5%). This is more or less equivalent to a combination of the definitions of *locally rare* (present in three or fewer moveable 1km squares) and *locally scarce* (present in 4 – 10 sites) used by BSBI for County Rare Plant Registers.

CUMBRIAN SCARCITY

Scarce species are defined as those recorded from 11 to 60 tetrads in the county. 11 to 60 tetrads is the equivalent proportion of tetrads in Cumbria to the proportion of hectads used to define *scarce* in the national context (16 to 100, 3.5%).

DATA AND ITS LIMITATIONS

The guidelines are based upon the best information currently available on the quality and distribution of habitats and species in Cumbria. This knowledge is not spread evenly across all habitats and species and this is inevitably reflected in the guidelines. For some habitats, such as lowland raised bog, virtually all existing sites are known, whilst for others, particularly those which have only recently come to prominence following the 2007 review of the UK Biodiversity Action Plan such as traditional orchards, relatively little is known about the

[21] Biodiversity Reporting and Information Group. 2007. Report on the Species and Habitat Review. Report to the UK Biodiversity Partnership. (http://www.ukbap.org.uk/bapgrouppage.aspx?id=112)

extent of high quality examples in the county. Likewise, a considerable amount of information on vascular plants and birds in Cumbria is available, but data on less easily recognised groups such as fungi, lichens and most invertebrates is at best patchy and for some groups there is little or no systematic survey data available so that it is difficult or impossible to make meaningful judgements about them. Where this is the case more specific guidelines may be appropriate if and when further information becomes available.

LIMITATIONS OF THE GUIDELINES AND EXCLUDED SITES

Although the wildlife of Cumbria is largely dependent upon the existence of semi-natural areas, some artificial habitats are also important. Certain species depend on habitats which are obviously artificial in character and whilst some of these, for example hedgerows, are covered by guidelines some are not. In particular residential buildings and gardens are excluded, though a small number of industrial buildings and sites are covered by guidelines, such as those for some colonial nesting birds (gulls), bat roosts, and natterjack toad and great crested newt sites. There are also some large areas of intensively cultivated agricultural land which are important for feeding wintering and passage wildfowl, mainly around the Solway Firth, which are currently not covered by guidelines as the usage of particular fields varies considerably from year to year making it impractical to select specific areas as wildlife sites.

PROTOCOL FOR SITE SELECTION

A site will be selected based on up to date survey information. The Site Selection Panel carries out the selection process and all sites brought before the Panel will be considered. A professional approach is taken to the consideration of proposed Cumbria County Wildlife Sites and the Site Selection Panel will ensure that it has the technical knowledge and adequate information to make informed decisions. The Site Selection Panel will seek further advice from particular specialists or experts as necessary. The list of the current approved Cumbria County Wildlife Sites will be prepared and maintained by Cumbria Wildlife Trust and shared with Cumbria Biological Records Centre in conjunction with the Cumbria County Wildlife Site Partnership.

Site selection should follow the following procedure. This applies both to new sites and existing sites under review:

1. A provisional survey boundary should be established using a combination of existing data and recent aerial photographs. This is particularly important when reviewing existing sites as there may be potentially qualifying habitat outside the current site boundary. Conversely it may become apparent that the features for which the site was originally selected are no longer present.

2. Once a survey boundary has been established land owners should be contacted to gain permission to survey the land.

3. Field survey should be undertaken by a competent surveyor at a suitable time of year for the habitat(s) and species present. The field survey should map the ecological habitats present and determine a definitive site boundary.

4. If the site is judged by the surveyor(s) and Cumbria County Wildlife Site Officer/Coordinator to meet one or more guidelines it will be put forward for consideration as a Cumbria County Wildlife Site. The justification for this proposal will be noted and if a site does not qualify the reasons for this will also be noted.

5. Where existing sites are being reviewed amendments to their boundaries should also be considered, as should the removal of sites which are found to no longer meet the selection guidelines.

6. A selection proposal document should be drawn up for each proposed site detailing the guidelines for which the site qualifies, a site description, a habitat map and a proposed boundary.

7. The Panel will consider each site and make a decision as to whether a site should:

   - be accepted as a new Cumbria County Wildlife Site;
   - be rejected as a new Cumbria County Wildlife Site;
   - remain a Cumbria County Wildlife Site with its existing boundaries or with an amended boundary;
   - be deselected and removed from the Cumbria County Wildlife Site Register.

   There should be a presumption not to remove a site unless there is current data which clearly refutes its status as a Wildlife Site.

   If it is not possible to make a decision it may be deferred with a suggestion for further survey work.

8. For decisions to be made by the Sites Selection Panel at least 3 members from 3 partner organisations plus the chair must be present.

9. Sites proposed for selection should then be evaluated by the Cumbria County Wildlife Site Selection Panel. Generally this will occur at a formal meeting: however, in a few exceptional cases where a site is under threat and a decision is required before a meeting of the whole Panel can be arranged, it may be appropriate for the Cumbria County Wildlife Site Officer/Coordinator to contact Panel members individually.

10. The decisions of the panel will be recorded in the minutes of the meeting and records will be amended as appropriate.

11. No guideline can be absolutely rigid. Sites may be encountered that are of undoubted conservation value although they do not meet the criteria precisely. While surveyors should have the guidelines in mind, they should not be prevented from making recommendations based on their judgement of conservation value. The Panel will use its own judgement in evaluating proposals. The reasons for selection of a site will be clearly stated on the citation and in the minutes of the Panel.

REVIEWING THE GUIDELINES

Even for well studied habitats and species new data is continually being collected. Climate change and other factors may produce changes in the distribution and extent of species and even some habitats. As a consequence, these guidelines are almost certain to need refinement and revision in the future. The Cumbria County Wildlife Site Partnership will continually review them to take account of new data, changes in Government policy and new scientific understanding.

CUMBRIA COUNTY WILDLIFE SITE DATA

All data generated by the Cumbria County Wildlife Site system is held by the Cumbria Wildlife Trust on behalf of the Partnership in accordance with the Data Protection Act. The data belongs to the Cumbria Wildlife Trust. As much of the habitat and species data is provided to local authorities in relation to the planning process much of it is in the public domain.

CONFIDENTIALITY AND DATA PROTECTION

The systems used to store and handle Cumbria County Wildlife Site data have been assessed against the relevant data protection legislation and are, to the best of the partnership's knowledge, fully compliant.

Information on protected species and advice on relevant legal implications is given to the owners and managers of the sites where appropriate. All data collected as part of surveying current and potential Cumbria County Wildlife Sites is covered by the provisions of the Environmental Information Regulations 2004. This means all species and habitat data will be considered available for release to third parties (including consultants and developers) unless release is judged to be against the public interest. In exceptional circumstances certain records (particularly of sensitive features) collected as part of a survey for a Cumbria County Wildlife Site may not be released. If future release of the data would lead to the landowner not granting permission to survey, it may be considered that it is in the public interest to withhold the data, but this would be an exception to the normal policy to release data.

Data that has historically been in the public domain and an explanation of the reason for Cumbria County Wildlife Site selection will remain generally available. However land ownership details that are covered by the Data Protection Act will not be divulged without prior permission.

WOODLAND, PARKLAND, SCRUB AND HEDGEROWS

GUIDELINE

Wd1

Sites included in the Ancient Woodland Inventory for England which support semi-natural woodland vegetation

APPLICATION

All sites listed on the Ancient Woodland Inventory for England should be included except sites that have become degraded and lost most of their characteristic features. Sites which are on ancient woodland sites but which have become significantly degraded are recognised as prime locations for habitat restoration but are not, in their present form, considered suitable for selection as Wildlife Sites.

This guideline can also be applied to ancient woodland sites that have been replanted with either broad-leaved or coniferous species (plantations on ancient woodland sites, PAWS) provided that the groundflora is strongly indicative of semi-natural woodland.

Ancient woodland is a term which is applied to woodlands which have existed from at least medieval times to the present day without ever being cleared for uses other than wood or timber production. A convenient date used to separate ancient and secondary woodland is about the year 1600, however in Cumbria records are rarely available from earlier than the late 18th century.

JUSTIFICATION

The inventory includes all woods over 2 hectares considered to be ancient in origin. As the irreplaceable remnants of the natural climax vegetation of most of Cumbria, all such sites are considered to be of high ecological value. This also applies to woods which have been extensively modified, for example by replanting with non-native tree species, but retain some of their ancient features, such as their ground flora.

GUIDELINE

Wd2

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

APPLICATION

Ancient semi-natural woodlands which are not included in the inventory can be included here. Woods should only be selected under this guideline if there is strong evidence that they are of ancient origin and/or they are especially good examples of particular semi-natural types. Reference should be made to Section 2.2 of the Provisional Cumbrian Inventory of Ancient Woodland which provides guidance and notes of caution when identifying ancient woodland in Cumbria.

This guideline can also be applied to ancient woodland sites that have been replanted with either broad-leaved or coniferous species (plantations on ancient woodland sites, PAWS) provided that the groundflora is strongly indicative of semi-natural woodland.

JUSTIFICATION

The Ancient Woodland Inventory for England only includes woods of 2ha or more. This excludes large numbers of ancient woodlands which do not meet this national size threshold but which never the less constitute an important part of the of the ecological fabric of the county. In addition there are a large number of gill woodlands in Cumbria which are smaller than 2ha in vertical projection. These sites are, however, likely to be some of the most important sites in the county. Most have been left ungrazed and unmanaged so are possible true remnants of primary woodland, and may be important for rare species.

GUIDELINE

Wd3

Recent (post 1600) woodlands of 1ha or more where the groundflora conforms to one or more of the following BAP habitat types:

upland oakwood

upland mixed ashwoods

lowland mixed deciduous woodland

wood-pasture and parkland

APPLICATION

This guideline will apply to all areas of semi-natural woodland not listed on the Ancient Woodland Inventory for England and to plantations (broadleaf and coniferous). In sites with a re-planted coniferous or broadleaf stand, groundflora species consistent with the BAP habitat type should occur throughout the body of the wood and not be just restricted to the boundaries.

JUSTIFICATION

Much ancient woodland has been felled and replanted. These woodlands can continue to support features of ancient woodlands such as species-rich rides and remnants of the ancient woodland flora. This remaining interest and the potential for recovery cannot be replaced once lost and should be protected from adverse land-use change such as development or agricultural conversion and intensification. These woodlands are considered an important part of the woodland nature conservation resource in Cumbria.

GUIDELINE

Wd4

Stands of semi-natural woodland or scrub that are assigned to the following NVC communities:

W1 Salix cinerea - Galium palustre woodland

W2 Salix cinerea - Betula pubescens – Phragmites australis woodland

W3 Salix pentandra - Carex rostrata woodland

W4 Betula pubescens – Molinia caerulea woodland

W5 Alnus glutinosa – Carex paniculata woodland

W6 Alnus glutinosa – Urtica dioica woodland

W7 Alnus glutinosa – Fraxinus excelsior – Urtica dioica woodland

APPLICATION

This guideline should be applied to semi-natural woodland and not plantation woodland. The woodland should display biological and physical features consistent with the NVC communities, but does not have to be an ideal fit. For example, the dominant canopy species may not resemble the NVC community, whilst the field layer composition may be a better indication of the NVC community type.

Where wet woodland has resulted from the degradation of mire habitat then care needs to be taken as to whether the swamps, fens and lowland raised bogs or woodland guidelines are applied.

The following minimum size thresholds apply:

W1	Salix cinerea - Galium palustre woodland	1 ha
W2	Salix cinerea - Betula pubescens – Phragmites australis woodland	0.25 ha
W3	Salix pentandra - Carex rostrata woodland	0.25 ha
W4	Betula pubescens – Molinia caerulea woodland	1 ha
W5	Alnus glutinosa – Carex paniculata woodland	0.25 ha
W6	Alnus glutinosa – Urtica dioica woodland	1 ha
W7	Alnus glutinosa – Fraxinus excelsior – Urtica dioica woodland	0.25 ha

JUSTIFICATION

Wet woodlands are a priority habitat in both the UK and Cumbria BAP and are often present as small stands which would not meet the size thresholds used in guidelines Wd1, Wd2 and Wd3.

W2, W3, W5 and W7 are particularly rare in Cumbria and often occur in small stands and so a smaller size threshold is applied for these woodland types.

GUIDELINE

Wd5

Areas of semi-natural scrub or woodland larger than 0.5ha that belong to one of the following NVC communities:

W21 *Crataegus monogyna – Hedera helix* scrub

W22 *Prunus spinosa – Rubus fruticosus* scrub

W23 *Ulex europaeus – Rubus fruticosus* scrub

APPLICATION

Shrub cover need not be continuous and up to 33% cover of non-scrub or woodland habitat is acceptable. Where more than one third of the area is non-scrub then the site should be selected using the Habitat Mosaics guideline. Care needs to be exercised when selecting sites for scrub in conjunction with habitats meriting selection under other guidelines, for example calcareous grassland, that an appropriate balance between the scrub and other habitat is maintained through management, such that scrub does not spread to the detriment of the other habitat(s).

JUSTIFICATION

Scrub is an undervalued habitat which provides essential or important habitat requirements for many species of higher plants, herbivorous insects and birds, including Red Data Book and UK BAP priority species. It is also likely to be equally important for lower plants, non-herbivorous invertebrates, reptiles and amphibians, and mammals.

GUIDELINE

Wd6

Areas of W19 *Juniperus communis* spp. *communis – Oxalis acetosella* woodland and juniper scrub larger than 0.5ha

APPLICATION

Juniper cover need not be continuous and very open areas of juniper scrub may be selected, particularly where very extensive areas are concerned.

JUSTIFICATION

Juniper is a Priority Species in both the UK and Cumbria BAPs. All significant stands of juniper merit protection.

GUIDELINE

Wd7

Broadleaved woodlands of 1 ha or more containing 5 or more large veteran broadleaved trees per hectare

APPLICATION

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

Large veteran trees are those with a trunk diameter at breast height (dbh) equal to or greater than the value given in the *valuable* column in Table 4. To be used for selection a tree must also support at least two of the following features[22]:

- major trunk cavities/progressive hollowing;
- naturally forming water pools;
- decay holes;
- physical damage to trunks;
- bark loss/loose bark;
- large quantities of dead wood in the canopy;
- sap runs;
- crevices in the bark, under branches or in the root plate sheltered from direct rainfall;
- fungal fruiting bodies (e.g. from heart rotting species);
- epiphytic plants.

Trees with much dead wood in their crowns and large dead limbs and stems in situ are of particular value, as are sites where there is a large amount of dead wood left on the ground.

Large veteran pollards and coppice stools should be considered for selection. As a guide, coppice stools should be greater than 1m in diameter to be considered.

JUSTIFICATION

Old and over-mature woodland trees are extremely valuable wildlife habitats. They provide habitat for a range of rare and uncommon species, including birds, bats, invertebrate, fungi and lichens, as well as habitat continuity for species with limited powers of dispersal and colonisation.

[22] Characteristics of veteran trees listed in Read, H. (2000) Veteran trees: A Guide to good management. English Nature. Peterborough

GUIDELINE

Wd8

Parklands and similar situations with at least 1 truly ancient tree and at least 4 large veteran trees, or at least 15 large veteran trees

APPLICATION

Trees may be native or non-native species, but must be broadleaved.

Table 4 provides a guide to assessing whether a tree is truly ancient or a large veteran, based on trunk diameter at breast height (note that at higher altitudes and other situations of high environmental stress truly ancient trees may be smaller than indicated in this table). Truly ancient trees will generally have a dbh greater than that given in the *truly ancient* column and are likely to have significant trunk hollowing and significant crown die back (as a result of natural retrenchment[23] through ageing), often accompanied by re-iterative epicormic growth[24], though this will not apply to working pollards. It should be noted that distinguishing between truly ancient and large veteran trees in the field can be difficult. The term *ancient* refers specifically to the age class of tree, describing the stage of development in the aging process beyond full maturity. Large veteran trees are those with a trunk diameter at breast height (dbh) equal to or greater than the value given in the *valuable* column. This category is based solely on tree size. Trees with much dead wood in their crowns and large dead limbs and stems in situ are of particular value, as are sites where there is a large amount of dead wood left on the ground.

Ancient pollards and coppice stools should be considered for selection. As a guide, coppice stools should be greater than 1m in diameter to be considered.

JUSTIFICATION

Old and over-mature trees are extremely valuable wildlife habitats. They provide habitat for a range of rare and uncommon species, including birds, bats, invertebrate, fungi and lichens, as well as habitat continuity for species with limited powers of dispersal and colonisation. In some areas the oldest surviving trees are associated with parklands rather than woodlands. Veteran trees are a rare and threatened habitat both in Cumbria and nationally. Woodland pasture and parkland is a UK BAP Priority Habitat.

[23] A process whereby a tree with crown dieback forms a smaller, lower crown

[24] Literally, growth 'upon stem', initially appearing as twiggy growth apparently from the bark surface. There are two types, that from dormant buds and that developing adventitiously

Table 4 Veteran tree rule of thumb trunk diameters[25]

These 'rules of thumb' collate the maximum trunk sizes recorded by Mitchell (1974)[26] for each species and adapting categories of 'potentially interesting', 'valuable' and 'truly ancient' described by Read (2000)[27] to relate to these maximum trunk sizes.

		Diameter at Breast Height (1.3m) in metres[28]			
		Max diameter	**Potentially interesting**	**Valuable**	**Truly ancient**
Acer campestre	field maple	0.96	0.31	0.45	0.60
Acer platanoides	Norway maple	1.27	0.41	0.60	0.80
Acer pseudoplatanus	sycamore	2.23	0.71	1.05	1.39
Aesculus hippocastanum	horse chestnut	2.04	0.65	0.96	1.27
Alnus glutinosa	alder	1.18	0.38	0.55	0.74
Alnus incarna	grey alder	0.64	0.20	0.30	0.40
Arbutus unedo	strawberry tree	0.38	0.12	0.18	0.24
Betula pendula	silver birch	0.96	0.31	0.45	0.60
Betula pubescens	downy birch	0.96	0.31	0.45	0.60
Buxus sempervirens	box	0.25	0.08	0.12	0.16
Carpinus betulus	hornbeam	1.27	0.41	0.60	0.80
Castanea sativa	sweet chestnut	3.18	1.02	1.50	1.99
Crataegus monogyna	hawthorn	0.96	0.31	0.45	0.60
Fagus sylvatica	beech	1.97	0.63	0.93	1.23
Fraxinus excelsior	ash	1.91	0.61	0.90	1.19
Ilex aquifolium	holly	0.57	0.18	0.27	0.36
Juglans regia	walnut	1.91	0.61	0.90	1.19
Malus sylvestris	crab apple	0.96	0.31	0.45	0.60
Mespilus germanica	medlar	0.48	0.15	0.22	0.30
Pinus sylvestris	Scot's pine	1.59	0.51	0.75	0.99
Populus x canadensis var serotina	black Italian poplar	1.91	0.61	0.90	1.19
Populus alba	white poplar	0.64	0.20	0.30	0.40
Populus nigra	black poplar	1.59	0.51	0.75	0.99
Populus x canescens	grey poplar	1.59	0.51	0.75	0.99
Prunus avium	wild cherry	1.43	0.46	0.67	0.90
Pyrus pyraster	wild pear	0.64	0.20	0.30	0.40
Quercus cerris	Turkey oak	2.55	0.82	1.20	1.59
Quercus ilex	evergreen oak	1.37	0.44	0.64	0.86
Quercus petraea	sessile oak	2.83	0.91	1.33	1.77
Quercus robur	pedunculate oak	3.18	1.02	1.50	1.99
Robinia pseudoaccacia	false acacia	1.59	0.51	0.75	0.99
Salix caprea	goat willow	1.27	0.41	0.60	0.80
Salix fragilis	crack willow	1.11	0.36	0.52	0.70
Sorbus aria agg	common whitebeam	0.60	0.19	0.28	0.38
Sorbus aucuparia	rowan	0.80	0.25	0.37	0.50
Sorbus intermedia agg	Swedish whitebeam	0.64	0.20	0.30	0.40
Sorbus latifolia agg	broad-leaved whitebeam	0.86	0.28	0.40	0.54
Sorbus torminalis	wild service tree	0.89	0.29	0.42	0.56
Sorbus x thuringiaca		0.48	0.15	0.22	0.30
Taxus baccata	yew	3.18	1.02	1.50	1.99
Tilia cordata	small-leaved lime	1.91	0.61	0.90	1.19
Tilia platyphyllos	large-leaved lime	1.85	0.59	0.87	1.15
Tilia x europea	lime	2.23	0.71	1.05	1.39
Ulmus glabra	wych elm	2.23	0.71	1.05	1.39
Ulmus minor	small-leaved elm	1.94	0.62	0.91	1.21
Ulmus procera	English elm	2.23	0.71	1.05	1.39
Ulmus x hollandica	Dutch elm	1.59	0.51	0.75	0.99
Ulmus x vegeta	Huntingdon elm	1.75	0.56	0.82	1.09

[25] From Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London.

[26] Mitchell, A. F., (1974) A field guide to the trees of Britain and Northern Europe. Collins, London.

[27] Read, H. (2000) Veteran trees: A Guide to good management. English Nature. Peterborough

[28] Where the trunk forks below 1.3m the trunk diameter should be measured below the fork. Where there are significant bulges or cankers at 1.3m the diameter should be measured below the bulge.

GUIDELINE

Wd9

Traditional orchards or groups of orchards of 0.25ha or more with five or more fruit trees showing signs of decay in the form of cavities in trunks and/or fallen branches on the orchard floor, sap runs, hollow trunks, split bark or other features of veteran trees[29];

or regularly supporting at least one of the following:

- **One or more UK Red Data Book species or UK BAP Priority Species (all species groups)**
- **Two or more species which are rare[30] or scarce[31] in Cumbria (all species groups)**

APPLICATION

Traditional orchards, as distinct from non-traditional orchards, are defined for priority habitat purposes as orchards managed in a low intensity way. They contrast with orchards managed intensively for fruit production, where there are inputs of chemicals such as pesticides and inorganic fertilisers, frequent mowing of the orchard floor rather than grazing or cutting for hay, and planting of short-lived, high-density, dwarf or bush fruit trees (stems generally 75cm or less). The simplest visual indicator of intensive management is the presence of herbicided strips along the tree rows, where the ground is generally bare or with some annual plant regrowth, contrasting with the permanent grassland of the between-row spaces. Spacing of trees in traditional orchard can vary quite widely from around 3m to over 20m between trees, whilst intensively managed orchards tend to have far denser spacing, i.e. less than 3m.

Many orchards in Cumbria are small and in some circumstances it may be appropriate to select groups of closely situated small orchards, such that the total area of orchard selected is greater than 0.25ha rather than each individual orchard being greater than 0.25ha. Where this is the case there should be some form of linkage between the component orchards in the form of hedgerows, streams, scattered trees or shrubs or strips of semi-natural grassland. In the Lyth Valley consideration should be given to the inclusion of damson hedges in sites where these are adjacent to orchards.

JUSTIFICATION

Traditional orchards is a UK BAP Priority Habitat. These orchards can support a wide range of plant and animal species, including rare and uncommon birds and invertebrates, fungi and lichens. Traditional orchards can also support rare and uncommon fruit cultivars. This guideline is intended to select those orchards which are of biodiversity significance in Cumbria.

Fruit trees exhibiting features of veteran trees are likely to be of considerable age and indicative of orchards with high biodiversity.

[29] See Read, H. (2000) Veteran trees: A Guide to good management. English Nature. Peterborough

[30] Rare species in Cumbria occur in fewer than 10 tetrads in the county

[31] Scarce species in Cumbria occur in 11 to 60 tetrads in the county

GUIDELINE

Wd10

A hedgerow or group of connected hedgerows of at least 50m in combined length with more than 90% cover of native woody species and six or more native woody species in a 30m long sample and at least one of the following:

- **eight or more non-woody species from Table 6**
- **one or more large veteran trees**

APPLICATION

A hedgerow is defined as any boundary line of shrubs over 20m long and less than five metres wide, provided that at one time the trees and shrubs were more or less continuous. Any gap over 20m long marks the end of the hedgerow. Hedges planted within the past 30 years are excluded. Any bank, wall, ditch or tree within 2 m of the centre of the hedgerow is considered to be part of the hedgerow habitat, as is the herbaceous vegetation within 2 m of the centre of the hedgerow. The boundary of the site must include a buffer zone of at least 2 metres around the hedgerow.

The presence of stone and earth banks often indicates older hedgerows, particularly in the west of the county.

Native woody species are listed in Table 5 and exclude sycamore, beech and Scot's pine. The woody species should be recorded from a 30m sample starting 30m from one of the end points of the hedgerow. If the sample hedgerow is less than 60m in length then the survey section will include the 'far' end of the hedgerow and the length at the beginning will have to be reduced to accommodate the 30m survey section. The 30m section should have as few gaps as possible, where the selected 30m survey section falls within a gappy part of hedgerow and can be moved to a part with continuous canopy, this should be done.[32]

Non-woody species should be recorded from the whole length of the hedgerow or group of hedgerows, rather than from a sample length and from within 2 m of the centre of the hedgerow.

Large veteran trees may be native or non-native species. Table 4 provides a guide to assessing whether a tree is a large veteran or not, based on trunk diameter at breast height. The trees used for selection must be in the *valuable* or *truly ancient* category and support at least two of the following features to qualify:

- major trunk cavities/progressive hollowing;
- naturally forming water pools;
- decay holes;
- physical damage to trunks;
- bark loss/loose bark;
- large quantities of dead wood in the canopy;
- sap runs;
- crevices in the bark, under branches or in the root plate sheltered from direct rainfall;
- fungal fruiting bodies (e.g. from heart rotting species);
- epiphytic plants.

Where a suite of hedgerows meeting the guidelines is identified in an area then all interconnecting hedgerows should be considered for inclusion.

Hedgerow networks which are important for the migration, dispersal and genetic exchanges of plants and animals are selected under Guideline HM3.

[32] Defra. 2007. Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London

JUSTIFICATION

Hedgerows is a UK BAP Priority Habitat. Where they are long established features in the landscape they can support a good diversity of plant and animal species. Many may be remnants of ancient woodland and as such cannot be replaced once lost. Old and over-mature trees are invaluable wildlife habitats providing habitat for a wide variety of mammals, birds, invertebrates and plants. Hedgerows are important linear features and wildlife corridors.

Table 5 Native woody species in hedgerows (from Defra, 2007[33])

Scientific name	Common name	Scientific name	Common name
Acer campestre	field maple	*Rosa arvensis*	field rose
Alnus glutinosa	alder	*Rosa caesia*	hairy dog rose
Berberis vulgaris	barberry	*Rosa canina* agg.	dog rose
Betula pendula	silver birch	*Rosa mollis* agg	soft downy rose
Betula pubescens	hairy birch	*Rosa rubiginosa*	sweet briar
Cornus sanguinea	dogwood	*Rosa sherardii*	Sherard's downy rose
Corylus avellana	hazel	*Rubus idaeus*	raspberry
Crataegus laevigata	midland hawthorn	*Salix aurita*	eared sallow
Crataegus monogyna	hawthorn	*Salix caprea*	goat willow
Cytisus scoparius	broom	*Salix cinerea*	grey willow
Daphne laureola	spurge laurel	*Salix myrsinifolia*	dark-leaved willow
Daphne mezereum	mezereon	*Salix pentandra*	bay willow
Euonymus europaeus	spindle	*Salix phylicifolia*	tea-leaved willow
Frangula alnus	alder buckthorn	*Salix purpurea*	purple osier
Fraxinus excelsior	ash	*Sambucus nigra*	elder
Ilex aquifolium	holly	*Sorbus aria* agg.	whitebeam
Juniperus communis	juniper	*Sorbus aucuparia*	rowan
Ligustrum vulgare	privet	*Sorbus torminalis*	wild service tree
Malus sylvestris	crab apple	*Taxus baccata*	yew
Populus nigra ssp *betulifolia*	black poplar	*Tilia cordata*	small leaved lime
Populus tremula	aspen	*Ulex europaeus*	gorse
Prunus avium	gean / wild cherry	*Ulex gallii*	western gorse
Prunus padus	bird-cherry	*Ulex minor*	dwarf gorse
Prunus spinosa	blackthorn	*Ulmus glabra*	wych elm
Quercus petraea	sessile oak	*Ulmus minor*	smooth-leaved elm
Quercus robur	pedunculate oak	*Ulmus procera*	English elm
Rhamnus cathartica	purging buckthorn	*Viburnum lantana*	wayfaring tree
Ribes alpinum	mountain currant	*Viburnum opulus*	guelder rose
Ribes rubrum	red currant		

Table 6 Woodland plant species in hedgerows (from Defra, 2007)
(+ = not obviously/recently planted)

Scientific name	Common name	Scientific name	Common name
Actaea spicata	baneberry	*Lysimachia nemorum*	yellow pimpernel
Adoxa moschatellina	moschatel	*Lysimachia nummularia*	creeping jenny
Allium ursinum	ramsons	*Melampyrum pratense*	common cow wheat
Anemone nemorosa	wood anemone	*Melica nutans*	mountain melick
Angelica sylvestris	wild angelica	*Melica uniflora*	wood melick
Apium nodiflorum	fool's watercress	*Mercurialis perennis*	dog's mercury

[33] Defra. 2007. Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London; with species not recorded as native in Cumbria in Halliday, G. 1997. A Flora of Cumbria. University of Lancaster omitted. Not all species occur in hedgerows in Cumbria.

Table 6 Woodland plant species in hedgerows (from Defra, 2007)
(+ = not obviously/recently planted)

Scientific name	Common name	Scientific name	Common name
Aquilegia vulgaris +	columbine	*Milium effusum*	wood millet
Athyrium filix-femina	lady fern	*Moehringia trinervia*	three-veined sandwort
Blechnum spicant	hard fern	*Monotropa hypopitys*	yellow bird's-nest
Calamagrostis canescens	purple small-reed	*Myosotis laxa*	tufted forget-me-not
Caltha palustris	marsh marigold	*Myosotis scorpioides*	water forget-me-not
Campanula latifolia	giant bellflower	*Myosotis secunda*	creeping forget-me-not
Cardamine amara	large bittercress	*Narcissus pseudonarcissus*	wild daffodil
Carex remota	remote sedge	*Neottia nidus-avis*	bird's-nest orchid
Carex sylvatica	wood sedge	*Oenanthe crocata*	hemlock water-dropwort
Chrysosplenium alternifolium	alternate-leaved golden saxifrage	*Ophrys insectifera*	fly orchid
Chrysosplenium oppositifolium	opposite-leaved golden saxifrage	*Orchis mascula*	early-purple orchid
Convallaria majalis +	lily-of-the-valley	*Oreopteris limbosperma*	lemon scented fern
Crepis paludosa	marsh hawk's-beard	*Oxalis acetosella*	wood sorrel
Dryopteris aemula	hay-scented buckler-fern	*Paris quadrifolia*	herb paris
Dryopteris affinis ssp *borreri*	scaly male-fern	*Phegopteris connectilis*	beech fern
Dryopteris carthusiana	narrow buckler fern	*Phragmites australis*	common reed
Epipactis helleborine	broad leaved helleborine	*Phyllitis scolopendrium*	hart's tongue fern
Equisetum fluviatile	water horsetail	*Platanthera chlorantha*	greater butterfly orchid
Equisetum sylvaticum	wood horsetail	*Poa nemoralis*	wood meadow-grass
Equisetum telmateia	giant horsetail	*Polygonatum multiflorum*	Solomon's seal
Eupatorium cannabinum	hemp-agrimony	*Polypodium vulgare*	common polypody
Festuca altissima	wood fescue	*Polystichum aculeatum*	hard shield fern
Gagea lutea	yellow-star-of-Bethlehem	*Polystichum setiferum*	soft shield fern
Galium odoratum	sweet woodruff	*Primula vulgaris*	primrose
Geranium sylvaticum	wood crane's-bill	*Pyrola minor*	common wintergreen
Geum rivale	water avens	*Ranunculus auricomus*	goldilocks buttercup
Gymnocarpium dryopteris	oak fern	*Ranunculus flammula*	lesser spearwort
Helleborus viridis	green hellebore	*Sanicula europaea*	sanicle
Hordelymus europaeus	wood barley	*Stellaria alsine*	bog stitchwort
Hyacinthoides non-scripta	bluebell	*Stellaria nemorum*	wood stitchwort
Hydrocotyle vulgaris	marsh pennywort	*Tamus communis*	black bryony
Impatiens noli-tangere	touch-me-not balsam	*Teucrium scorodonia*	wood sage
Iris pseudacorus	yellow flag iris	*Thelypteris palustris*	marsh fern
Lamiastrum galeobdolon +	yellow archangel	*Trientalis europaea*	chickweed wintergreen
Lathraea squamaria	toothwort	*Valeriana dioica*	marsh valerian
Lithospermum officinale	gromwell	*Valeriana officinalis*	common valerian
Lonicera periclymenum	honeysuckle	*Veronica montana*	wood speedwell
Luzula pilosa	hairy wood-rush	*Vicia sylvatica*	wood vetch
Luzula sylvatica	great wood-rush	*Viola palustris*	marsh violet
Lychnis flos-cuculi	ragged robin	*Viola reichenbachiana*	early dog violet
Lycopus europaeus	gypsywort	*Viola riviniana*	common dog violet

GRASSLAND

GUIDELINE

Gr1

Areas of old, established semi-natural grasslands of at least 0.5 ha in size that support stands of one or more of the following NVC community types:

MG1 ***Arrhenatherum elatius*** **grassland**

MG2 ***Arrhenatherum elatius-Filipendula ulmaria*** **grassland**

MG3 ***Anthoxanthum odoratum-Geranium sylvaticum*** **grassland**

MG4 ***Alopecurus pratensis – Sanguisorba officinalis*** **grassland**

MG5 ***Cynosurus cristatus-Centaurea nigra*** **grassland**

MG6 ***Lolium perenne – Cynosurus cristatus*** **grassland**

MG8 ***Cynosurus cristatus-Caltha palustris*** **grassland**

CG2 ***Festuca ovina-Avenula pratensis*** **grassland**

CG9 ***Sesleria albicans-Galium sterneri*** **grassland**

CG10 ***Festuca ovina-Agrostis capillaris-Thymus praecox*** **grassland**

U1 ***Festuca ovina-Agrostis capillaris-Rumex acetosella*** **grassland**

U4c ***Festuca ovina-Agrostis capillaris-Galium saxatile*** **grassland,** ***Lathyrus montanus-Stachys betonica*** **sub-community**

U5c ***Nardus stricta-Galium saxatile*** **grassland,** ***Carex panicea - Viola riviniana*** **sub-community**

APPLICATION

This guideline will be applied to areas of ancient or long established semi-natural grassland that have been identified as supporting the NVC communities listed above and meet the quality guidelines[34] given in Table 7. Grasslands of known recently sown origin are not eligible under this guideline. A competent surveyor should base classification of the community on field assessment.

Frequency of occurrence of species for the quality guidelines should be recorded at 20 stops along a structured walk through the vegetation being assessed. The 20 stops should be recorded along a structured walk carried out across the vegetation community being surveyed. The route of the walk should cross the entire area to be assessed. It can be a W shape or a squashed, twisted or extended version depending on the shape of the area to be assessed. Stops should be carried out every 20 paces along the walk, rather than in locations chosen by the surveyor to reduce subjectivity. At each stop presence or absence of the species listed

[34] Adapted from English Nature Lowland grassland non-statutory site condition assessment forms for MG2, MG3, MG5, MG8, CG9, lowland acid grassland (U1-U4) and species-rich parched grassland (CG7a,b,d,e; U1b,c,d,f). No forms are available for CG10, MG1 or MG6. For CG10 the quality guidelines use a species list based on the CG9 guideline with additional species taken from the SSSI condition assessment form for CG10. The MG1 and MG6 guidelines are compiled from combined species lists for other neutral grasslands.

in Table 7 should be recorded from a 2m diameter circle around the observer. *Frequent* is defined as present at nine or more stops, *occasional* is defined as present at 5 to 8 stops.[35]

JUSTIFICATION

These grassland communities represent some of the rarest and most endangered grassland types in the UK and Cumbria. The presence of these communities usually indicates the grassland has not been improved through intensive agricultural management. As a consequence these grasslands support a good diversity of flowering plants, some of which are restricted to these habitats. Many of these grassland communities are now restricted to small areas but often continue to support rare or localised species.

Table 7 Grassland quality guidelines

NVC community	Quality guideline
MG1	At least 30% cover of herbs
	At least two species/taxa frequent and two occasional throughout the sward from the following: *Achillea ptarmica, Agrimonia eupatoria, Alchemilla spp., Anemone nemorosa, Angelica sylvestris, Caltha palustris, Cardamine pratensis, Centaurea nigra, Cirsium heterophyllum, Conopodium majus, Euphrasia* spp., *Filipendula ulmaria, Galium verum, Genista tinctoria, Geranium sylvaticum, Geum rivale, Lathyrus linifolius (=L. montanus), Lathyrus pratensis, Leontodon autumnalis, Leontodon hispidus/L. saxatilis, Leucanthemum vulgare, Lotus corniculatus, Lotus pedunculatus, Lychnis flos-cuculi, Mentha aquatica, Mercurialis perennis,* Orchidaceae spp., *Persicaria bistorta, Pimpinella saxifraga, Polygala* spp., *Potentilla erecta, Primula veris, Rhinanthus minor, Sanguisorba minor, Sanguisorba officinalis, Serratula tinctoria, Silaum silaus,* small blue-green *Carex* spp. (leaves less than 5mm wide) (=*C. flacca, C. nigra, C. panicea*), *Stachys officinalis, Succisa pratensis, Thalictrum flavum, Tragopogon pratensis, Trollius europaeus, Valeriana dioica, Valeriana officinalis, Viola palustris*
MG2	At least 30% cover of herbs
	At least two species/taxa frequent and two occasional throughout the sward from the following: *Alchemilla* spp., *Angelica sylvestris, Centaurea nigra, Cirsium heterophyllum,* Fern spp. (excluding *Pteridium aquilinum*), *Filipendula ulmaria, Galium verum, Geranium sylvaticum, Geum rivale, Mercurialis perennis, Sanguisorba officinalis, Succisa pratensis, Valeriana officinalis*
MG3	At least 40% cover of herbs
	At least two species/taxa frequent and two occasional throughout the sward from the following: *Alchemilla* spp, *Anemone nemorosa, Centaurea nigra, Cirsium heterophyllum, Conopodium majus, Euphrasia* spp., *Filipendula ulmaria, Geranium sylvaticum, Geum rivale, Lathyrus pratensis, Leontodon* spp, *Lotus corniculatus, Persicaria bistorta, Rhinanthus minor, Sanguisorba officinalis, Succisa pratensis, Trollius europaeus*
MG4	At least 30% cover of herbs
	At least one species frequent plus at least three species occasional throughout the sward or locally abundant in more than 10% of the sward, including at least one species frequent and one occasional or locally abundant from List A: List A: *Filipendula ulmaria, Leontodon autumnalis, Oenanthe silaifolia, Persicaria bistort, Sanguisorba officinalis, Silaum silaus, Succisa pratensis, Thalictrum flavum* List B: *Centaurea nigra, Filipendula vulgaris, Galium verum, Lathyrus pratensis, Leucanthemum vulgare, Lotus corniculatus, Primula veris, Rhinanthus minor, Serratula tinctoria, Stachys officinalis, Tragopogon pratensis*

[35] Methodology based on Robertson, H J and Jefferson, R G. 2000. Monitoring the condition of lowland grassland SSSIs. English Nature Research Report 315.

Table 7 Grassland quality guidelines	
NVC community	**Quality guideline**
MG5	At least 30% cover of herbs
	At least two species/taxa frequent and two occasional throughout the sward from the following: *Agrimonia eupatoria, Alchemilla spp., Anemone nemorosa, Centaurea nigra, Euphrasia* spp.*, Filipendula ulmaria, Filipendula vulgaris, Galium verum, Genista tinctoria, Lathyrus linifolius (=L. montanus), Lathyrus pratensis, Leontodon* spp*, Leucanthemum vulgare, Lotus corniculatus, Pimpinella saxifraga, Polygala* spp.*, Potentilla erecta, Primula veris, Rhinanthus minor, Sanguisorba minor, Sanguisorba officinalis, Serratula tinctoria, Silaum silaus, Stachys officinalis, Succisa pratensis, Tragopogon pratensis,* small blue-green *Carex* spp. (leaves less than 5mm wide) *(=C. flacca, C. nigra, C. panicea)*
MG6	At least 30% cover of herbs
	At least two species/taxa frequent and two occasional throughout the sward from the following: *Achillea ptarmica, Agrimonia eupatoria, Alchemilla spp., Anemone nemorosa, Caltha palustris, Cardamine pratensis, Centaurea nigra, Euphrasia* spp.*, Filipendula ulmaria, Filipendula vulgaris, Galium verum, Genista tinctoria, Geum rivale, Lathyrus linifolius (=L. montanus), Lathyrus pratensis, Leontodon autumnalis, Leontodon hispidus/L. saxatilis, Leucanthemum vulgare, Lotus corniculatus, Lotus pedunculatus, Lychnis flos-cuculi, Pimpinella saxifraga, Polygala* spp.*, Potentilla erecta, Primula veris, Rhinanthus minor, Sanguisorba minor, Sanguisorba officinalis, Serratula tinctoria, Silaum silaus, Stachys officinalis, Succisa pratensis, Tragopogon pratensis,* small blue-green *Carex* spp. (leaves less than 5mm wide) *(=C. flacca, C. nigra, C. panicea)*
MG8	At least 30% cover of herbs
	At least two species/taxa frequent and two occasional throughout the sward, or locally abundant over more than 10% of the sward from the following: *Achillea ptarmica, Caltha palustris, Cardamine pratensis, Eupatorium cannabinum, Filipendula ulmaria*, *Galium palustre/G. uliginosum*, *Geum rivale, Hydrocotyle vulgaris, Lotus pedunculatus, Lychnis flos-cuculi, Mentha aquatica,* Orchidaceae spp.*, Potentilla palustris, Ranunculus flammula,* small blue-green *Carex* spp. (leaves less than 5mm wide) (*=C. flacca, C. nigra, C. panicea*), *Succisa pratensis, Thalictrum flavum, Valeriana dioica, Viola palustris*
CG2	At least 30% cover of herbs
	At least three species/taxa frequent and three occasional throughout the sward from the following species: *Anthyllis vulneraria, Asperula cynanchica, Campanula glomerata, Filipendula vulgaris, Genista tinctoria, Gentianella* spp.*, Helianthemum nummularium, Hippocrepis comosa, Leontodon hispidus/L. saxatilis, Leucanthemum vulgare, Linum catharticum, Lotus corniculatus, Pilosella officinarum, Plantago media, Polygala* spp.*, Primula veris, Sanguisorba minor, Scabiosa columbaria, Serratula tinctoria, Succisa pratensis, Thymus* spp.
CG9	At least 20% cover of herbs
	Sesleria caerulea at least frequent throughout the sward
	At least one species/taxa frequent and three occasional throughout the sward from the following species: *Antennaria dioica, Armeria maritima, Asperula cynanchica, Carlina vulgaris, Campanula rotundifolia, Cochleria pyrenaica, Draba incana, Dryas octopetala, Euphrasia spp., Filipendula vulgaris, Galium sterneri, Gentiana verna, Gentianella* spp.*, Helianthemum canum, Helianthemum nummularium, Hippocrepis comosa, Leontodon hispidus, Lotus corniculatus, Myosotis alpestris, Parnassia palustris, Pilosella officinarum, Plantago maritima, Persicaria vivipara, Pinguicula vulgaris, Primula farinosa, Sanguisorba minor, Saxifraga hypnoides, Scabiosa columbaria, Selaginella selaginoides, Succisa pratensis, Thymus polytrichus*

Table 7 Grassland quality guidelines	
NVC community	**Quality guideline**
CG10	At least 30% cover of herbs
	At least one species/taxa frequent and three occasional throughout the sward from the following species: *Alchemilla alpina, Alchemilla glabra, Angelica sylvestris, Antennaria dioica, Armeria maritima, Asperula cynanchica, Carlina vulgaris, Campanula rotundifolia, Cochleria pyrenaica, Draba incana, Euphrasia spp., Filipendula ulmaria, Filipendula vulgaris, Galium sterneri, Galium verum, Gentiana verna, Gentianella* spp.*, Geum rivale, Helianthemum canum, Helianthemum nummularium, Hippocrepis comosa, Lathyrus linifolius, Leontodon hispidus, Linum catharticum, Lotus corniculatus, Myosotis alpestris, Parnassia palustris, Persicaria vivipara, Pilosella officinarum, Plantago maritima, Pinguicula vulgaris, Primula farinosa, Sanguisorba minor, Saxifraga hypnoides, Scabiosa columbaria, Selaginella selaginoides, Stachys officinalis, Succisa pratensis, Thymus polytrichus, Veronica officinalis*
U1	At least one species/taxa frequent and two occasional throughout the sward from the following species: *Anenome nemorosa, Calluna vulgaris, Campanula rotundifolia, Cladonia* spp.*, Erica* spp.*, Galium saxatile, Galium verum , Lathyrus linifolius (=L. montanus), Lotus corniculatus, Pedicularis sylvatica, Pilosella officinarum, Polygala* spp. *, Potentilla erecta, Rumex acetosella, Serratula tinctoria, Stachys officinalis, Succisa pratensis, Teucrium scorodonia, Vaccinium myrtillus, Veronica officinalis, Viola* spp.
U4c and U5c	At least one species/taxa frequent and three occasional throughout the sward from the following species: *Anenome nemorosa, Calluna vulgaris, Campanula rotundifolia, Cladonia* spp.*, Erica* spp.*, Galium saxatile, Galium verum , Lathyrus linifolius (=L. montanus), Lotus corniculatus, Pedicularis sylvatica, Pilosella officinarum, Polygala* spp. *, Potentilla erecta, Rumex acetosella, Serratula tinctoria, Stachys officinalis, Succisa pratensis, Teucrium scorodonia, Vaccinium myrtillus, Veronica officinalis, Viola* spp.

GUIDELINE

Gr2

Roadside verges and grassland along other linear features of 100m or more in length with both 15 or more species for calcareous or neutral grasslands or 8 or more species for acid or marshy grasslands from Table 8 and at least 30% cover of herbs

APPLICATION

All lengths of roadside verge greater than 100m in length excluding gateways, drives etc meeting the threshold species number and herb cover should be selected. Verges from more than one road can be combined in a site to meet the length threshold provided that any gaps between qualifying sections of grassland are no more than 20m apart. Where potentially qualifying verges are present on either side of a road these can be combined to meet the length and species thresholds. Where there are several verges in relatively close proximity which all meet the guideline in their own right they should be combined into a single site (for example a verges on a series of roads in a valley).

At least eight of the species used to select neutral or calcareous grasslands, or four for acid or marshy grasslands, should be *frequent* throughout the verge and the remainder *occasional* (as defined in Gr1).

Other linear features may include earth or stone boundary banks (kests), canals, railway lines and green lanes.

JUSTIFICATION

Roadside verges are a significant wildlife resource in Cumbria, supporting species-rich grasslands, diverse woodland floras and a range of other habitats. The 1992 roadside verge survey identified 6% of the total length of verge in Cumbria as having a large variety of species or hosting rare or uncommon species. The verges selected using this guideline will be the most species-rich grasslands and merit protection.

Table 8 Grassland and roadside verge species

Latin name	Common name	Latin name	Common name
Achillea ptarmica	sneezewort	*Knautia arvensis*	field scabious
Agrimonia eupatoria	agrimony	*Koeleria macrantha*	crested hair-grass
Aira caryophyllea	silver hair-grass	*Lathyrus linifolius*	bitter-vetch
Aira praecox	early hair-grass	*Lathyrus pratensis*	meadow vetchling
Ajuga reptans	bugle	*Leontodon autumnalis*	autumn hawkbit
Alchemilla alpina	alpine lady's-mantle	*Leontodon hispidus*	rough hawkbit
Alchemilla conjuncta	silver lady's-mantle	*Leontodon saxatilis*	lesser hawkbit
Alchemilla glabra	smooth lady's-mantle	*Leucanthemum vulgare*	oxeye daisy
Alchemilla glaucescens	a lady's-mantle	*Linum catharticum*	fairy flax
Alchemilla vulgaris agg.	lady's-mantle	*Listera cordata*	lesser twayblade
Alchemilla wichurae	a lady's-mantle	*Listera ovata*	common twayblade
Alchemilla xanthochlora	intermediate lady's-mantle	*Lotus corniculatus*	common bird's-foot-trefoil
Anacamptis pyramidalis	pyramidal orchid	*Lotus pedunculatus*	greater bird's-foot-trefoil
Anemone nemorosa	wood anemone	*Lychnis flos-cuculi*	ragged-robin
Angelica sylvestris	wild angelica	*Lythrum salicaria*	purple-loosestrife
Antennaria dioica	mountain everlasting	*Mentha aquatica*	water mint
Anthyllis vulneraria	kidney vetch	*Meum athamanticum*	spignel
Aphanes arvensis	parsley-piert	*Myosotis alpestris*	alpine forget-me-not
Aphanes australis	slender parsley-piert	*Neottia nidus-avis*	bird's-nest orchid
Armeria maritima	thrift	*Ophrys apifera*	bee orchid
Asperula cynanchica	squinancywort	*Ophrys insectifera*	fly orchid
Berula erecta	lesser water-parsnip	*Orchis mascula*	early-purple orchid
Briza media	quaking-grass	*Orchis morio*	green-winged orchid
Calluna vulgaris	heather	*Origanum vulgare*	marjoram
Caltha palustris	marsh-marigold	*Ornithopus perpusillus*	bird's-foot
Campanula glomerata	clustered bellflower	*Parnassia palustris*	grass-of-Parnassus
Campanula latifolia	giant bellflower	*Pedicularis palustris*	marsh lousewort
Campanula rotundifolia	harebell	*Pedicularis sylvatica*	lousewort
Cardamine pratensis	cuckooflower	*Persicaria bistorta*	common bistort
Carex capillaris	hair sedge	*Persicaria vivipara*	alpine bistort
Carex caryophyllea	spring-sedge	*Pilosella officinarum*	mouse-ear hawkweed
Carex flacca	glaucous sedge	*Pimpinella major*	greater burnet-saxifrage
Carex panicea	carnation sedge	*Pimpinella saxifraga*	burnet-saxifrage
Carex pulicaris	flea sedge	*Pinguicula vulgaris*	common butterwort
Carlina vulgaris	carline thistle	*Plantago coronopus*	buck's-horn plantain
Centaurea nigra	common knapweed	*Plantago maritima*	sea plantain
Centaurea scabiosa	greater knapweed	*Platanthera bifolia*	lesser butterfly orchid
Centaurium erythraea	common centaury	*Platanthera chlorantha*	greater butterfly orchid
Cirsium heterophyllum	melancholy thistle	*Polemonium caeruleum*	Jacob's-ladder
Clinopodium vulgare	wild basil	*Polygala serpyllifolia*	heath milkwort
Coeloglossum viride	frog orchid	*Polygala vulgaris*	common milkwort
Conopodium majus	pignut	*Potentilla erecta*	tormentil
Corallorhiza trifida	coralroot orchid	*Potentilla palustris*	marsh cinquefoil
Crepis paludosa	marsh hawk's-beard	*Primula farinosa*	bird's-eye primrose
Dactylorhiza fuchsii	common spotted-orchid	*Primula veris*	cowslip
Dactylorhiza incarnata	early marsh-orchid	*Pseudorchis albida*	small-white orchid

Table 8 Grassland and roadside verge species			
Latin name	**Common name**	**Latin name**	**Common name**
Dactylorhiza maculata	heath spotted-orchid	*Ranunculus flammula*	lesser spearwort
Dactylorhiza purpurella	northern marsh-orchid	*Rhinanthus minor*	yellow-rattle
Danthonia decumbens	heath-grass	*Rumex acetosella*	sheep's sorrel
Draba incana	hoary whitlowgrass	*Sanguisorba minor*	salad burnet
Dryas octopetala	mountain avens	*Sanguisorba officinalis*	great burnet
Epipactis atrorubens	dark-red helleborine	*Saxifraga aizoides*	yellow saxifrage
Epipactis helleborine	broad-leaved helleborine	*Saxifraga hypnoides*	mossy saxifrage
Epipactis leptochila agg.	narrow-lipped helleborine	*Scabiosa columbaria*	small scabious
Epipactis palustris	marsh helleborine	*Sedum acre*	biting stonecrop
Epipactis phyllanthes	green-flowered helleborine	*Sedum anglicum*	English stonecrop
Erica cinerea	bell heather	*Selaginella selaginoides*	lesser clubmoss
Erica tetralix	cross-leaved heath	*Serratula tinctoria*	saw-wort
Erodium cicutarium agg.	common stork's-bill	*Silaum silaus*	pepper-saxifrage
Euphrasia officinalis agg.	eyebright	*Spiranthes spiralis*	autumn lady's-tresses
Filipendula ulmaria	meadowsweet	*Stachys officinalis*	betony
Filipendula vulgaris	dropwort	*Succisa pratensis*	Devil's-bit scabious
Galium palustre	common marsh-bedstraw	*Teucrium scorodonia*	wood sage
Galium saxatile	heath bedstraw	*Thalictrum flavum*	common meadow-rue
Galium sterneri	limestone bedstraw	*Thymus polytrichus*	wild thyme
Galium uliginosum	fen bedstraw	*Tragopogon pratensis*	goat's-beard
Galium verum	lady's bedstraw	*Trollius europaeus*	globeflower
Genista tinctoria	dyer's greenweed	*Vaccinium myrtillus*	bilberry
Gentiana verna	spring gentian	*Valeriana dioica*	marsh valerian
Gentianella amarella	autumn gentian	*Valeriana officinalis*	common valerian
Gentianella campestris	field gentian	*Viola canina*	heath dog-violet
Geranium sanguineum	bloody crane's-bill	*Viola hirta*	hairy violet
Geranium sylvaticum	wood crane's-bill	*Viola lutea*	mountain pansy
Geum rivale	water avens	*Viola odorata*	sweet violet
Gymnadenia conopsea	fragrant orchid	*Viola palustris*	marsh violet
Helianthemum nummularium	common rock-rose	*Viola reichenbachiana*	early dog-violet
Helianthemum oelandicum	hoary rock-rose	*Viola riviniana*	common dog-violet
Hippocrepis comosa	horseshoe vetch	*Viola rupestris*	Teesdale violet
Hydrocotyle vulgaris	marsh pennywort	*Viola tricolor*	wild pansy
Jasione montana	sheep's-bit		

GUIDELINE

Gr3

Areas of grassland on previously developed land of at least 1 ha in size with 12 or more species listed in Table 8

APPLICATION

This guideline will be applied to areas of established grassland on former industrial sites and other brownfield land, for example areas of slag on former steel works. Grasslands of known recently sown origin are not eligible under this guideline.

At least six of the species used to select the site should be *frequent* throughout the site and six species *occasional* (as defined in Gr1).

JUSTIFICATION

Open Mosaic Habitats on Previously Developed Land is a priority habitat in the UKBAP. These grasslands can support diverse grassland communities supporting a range of regionally and nationally uncommon and threatened species.

"The decline of mining and heavy industry and the requirement for such types of development to include land restoration as part of planning permission has virtually halted the creation of new, large scale post industrial landscapes where colonisation and natural succession are left to prevail. Some of the best examples of this habitat were created some decades ago by industries that are now defunct (Leblanc, blast furnace slag), or spoil disposal methods that are no longer used (Solvay). Today, they would be unlikely to survive long enough to acquire a valuable flora or fauna before intervention. They are therefore effectively irreplaceable; at the time of their creation/abandonment, the wider landscape would have been much richer in species, providing a source for colonization. Today it is the previously developed land that is the source and represents important elements in wider landscape mosaics in supporting meta-populations of species of conservation importance.

Extant sites are at risk from redevelopment, landfill, industrial and commercial use, or housing, the latter being targeted on brownfield land. The 'reclamation' of bare ground and early successional habitats on previously developed land as amenity greenspace can be just as damaging, commonly involving the re-grading of landforms; the burial of existing substrates with the import of fertile soils; and the sowing of amenity grass mixes and planting of shrubs and trees, usually with the intention of 'quick greening'."[36]

Scoring species should be reasonably well distributed over the whole or a significant part of the site. Sites which meet the score criteria but where a high proportion of those species are very rare or restricted to non-typical patches or the edges of the site should not normally be selected.

GUIDELINE

Gr4

Mine rakes, spoil heaps and river shingles of at least 0.25 ha supporting characteristic semi-natural vegetation communities referable to the NVC community OV37 *Festuca ovina – Minuartia verna* community and/or the *Calaminarian Grasslands* UK BAP priority habitat with three or more of the following species:

Armeria maritima	**thrift**
Cochlearia pyrenaica	**alpine scurvygrass**
Minuartia verna	**spring sandwort**
Thlaspi caerulescens	**alpine pennycress**
Viola lutea	**mountain pansy**

APPLICATION

This guideline applies both to vegetation developed on heavy metal mining waste and spoil and vegetation on river shingles which contain a significant heavy metal component derived from reworked spoil. Sites selected

[36] Biodiversity reporting and Information Group. 2007. Report on the Species and Habitat review. Report to the UK Biodiversity Partnership. (http://www.ukbap.org.uk/library/BRIG/SHRW/SpeciesandHabitatReviewReport2007Annexes4-6.pdf)

should normally have a good distribution of mine waste communities throughout the site. This applies to series of botanically important spoil heaps or river shingles or groups of spoil heaps that form part of an identifiable ecological unit. Consequently, a single, isolated small mine tip in the middle of an improved pasture would not normally qualify for selection, except where it supports a particularly rich example of this vegetation.

JUSTIFICATION

These post-industrial habitats support unique plant communities that show a close association with metalliferous habitats. Calaminarian grasslands of the *Violetalia calaminariae* is listed on Annex 1 of the Habitats Directive and *calaminarian grasslands* is a priority habitat in the UKBAP. Some of the species typical of this habitat are nationally or locally scarce or rare. The Cumbrian North Pennines holds one of the main concentrations of this habitat in the UK.

SWAMPS, FENS AND LOWLAND RAISED BOGS

Fens and bogs differ in the source of mineral nutrients. Bogs are ombrotrophic, that is they receive their nutrients from precipitation, whilst fens are minerotrophic and receive their nutrients from ground water. The term mire covers both bog and fen vegetation. In swamps the substrate is permanently or seasonally submerged.

GUIDELINE

Fe1

Any raised bog or remnant raised bog with:

a) at least 25% cover of *Sphagnum* bog-mosses, and/or

b) three or more of the following species:

Andromeda polifolia	**bog rosemary**
Calluna vulgaris	**heather**
Erica tetralix	**cross-leaved heath**
Eriophorum angustifolium	**common cotton-grass**
Eriophorum vaginatum	**hare's-tail cotton-grass**
Trichophorum cespitosum	**deergrass**

APPLICATION

This guideline can be applied to any raised bog or remnant raised bog including degraded sites provided some remnants of raised bog vegetation remain and the peat body and its hydrology are not compromised by past activities to such an extent that there is no reasonable chance of maintenance or restoration. Cover of *Sphagnum* should be assessed across the whole peat body. Species listed under b) need only be present, irrespective of their abundance or distribution on the site. Areas of lagg fen should be included within the site when present.

JUSTIFICATION

Raised bogs, particularly lowland examples, are rare habitats nationally and are listed on Annex 1 of the EC Habitats Directive. *Lowland raised bog* is a priority habitat in both the UK and Cumbria BAPs.

Bogs with a high cover of *Sphagnum* indicate either relatively little disturbance in the past or a regenerating bog surface following the on-set of more favourable conditions.

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

GUIDELINE

Fe2 **Any tall herb fen, swamp or reedbed greater than 0.5ha**

APPLICATION

This guideline can be applied to any tall herb fen, swamp or reedbed greater than 0.5ha (with the exception of species-poor stands of S28 *Phalaris arundinacea* fen, where stands should be greater than 2ha) provided they are hydrologically sustainable. This vegetation is likely to belong to the following NVC communities:

S1 *Carex elata* sedge-swamp
S2 *Cladium mariscus* swamp and sedge-beds
S4 *Phragmites australis* swamp and reedbeds
S5 *Glyceria maxima* swamp
S7 *Carex acutiformis* swamp
S8 *Scirpus lacustris* ssp. *lacustris* swamp
S9 *Carex rostrata* swamp
S11 *Carex vesicaria* swamp
S19 *Eleocharis palustris* swamp
S20 *Scirpus tabernaemontani* swamp
S21 *Scirpus maritimus* swamp
S27 *Carex rostrata - Potentilla palustris* tall-herb fen
S28 *Phalaris arundinacea* tall herb fen
M27 *Filipendula ulmaria – Angelica sylvestris* mire

These communities are known to occur in Cumbria, however this should not be viewed as an exclusive list. Qualifying vegetation may be composed either of a single vegetation type or a combination of communities. Fringing vegetation around lakes and tarns and along the margins of rivers may be selected as well as stands not associated with open water.

JUSTIFICATION

Tall-herb fens have been adversely affected by agricultural intensification over the last 50 years resulting in the reduction and fragmentation of this habitat. This vegetation is covered by the following UK BAP priority habitats: *reedbeds, lowland fens* and *upland flushes, fens and swamps*.

GUIDELINE

Fe3 **Any fen meadow, purple moor-grass or rush pasture greater than 0.5ha with six or more species from Table 9**

APPLICATION

This guideline can be applied to any fen meadow, purple moor-grass or rush pasture greater than 0.5ha with six or more species from Table 9. Scoring species should be reasonably well distributed over the whole or a significant part of the site. Sites which meet the score criteria but where a high proportion of those species are very rare or restricted to non-typical patches or the edges of the site should not normally be selected. This vegetation is likely to belong to the following NVC communities:

M23 *Juncus effusus/acutiflorus – Galium palustre* rush pasture,
M25 *Molinia caerulea – Potentilla erecta* mire, or
M26 *Molinia caerulea – Crepis paludosa* mire.

Table 9 Plant species of fen meadows and rush pastures

Scientific name	Common name		
Achillea ptarmica	sneezewort	*Narthecium ossifragum*	bog asphodel
Angelica sylvestris	wild angelica	Orchidaceae spp.	orchid species
Caltha palustris	marsh marigold	*Parnassia palustris*	grass-of-Parnassus
Centaurea nigra	common knapweed	*Pedicularis sylvatica*	lousewort
Crepis paludosa	marsh hawk's-beard	*Pedicularis palustris*	marsh lousewort
Erica tetralix	cross-leaved heath	*Potentilla palustris*	marsh cinquefoil
Filipendula ulmaria	meadowsweet	*Scutellaria galericulata*	skull-cap
Galium palustre	marsh bedstraw	*Serratula tinctoria*	saw-wort
Geum rivale	water avens	*Stachys palustris*	marsh woundwort
Hydrocotyle vulgaris	marsh pennywort	*Stellaria alsine*	bog stitchwort
Lathyrus pratensis	yellow vetchling	*Succisa pratensis*	Devil's-bit scabious
Leontodon hispidus	rough hawkbit	*Triglochin palustris*	marsh arrowgrass
Lotus pedunculatus	greater bird's-foot trefoil	*Trollius europaeus*	globe flower
Lychnis flos-cuculi	ragged robin	*Valeriana dioica*	marsh valerian
Lysimachia vulgaris	yellow loosestrife	*Valeriana officinalis*	common valerian
Lythrum salicaria	purple loosestrife	*Viola palustris*	marsh violet
Mentha aquatica	water mint		

JUSTIFICATION

Herb and species-rich fen meadows and rush pastures have become rare due to agricultural improvement, particularly drainage and any extant examples merit protection. This vegetation is covered by the following UK BAP priority habitat: *purple moor-grass and rush pastures*.

GUIDELINE

Fe4

Any basin or valley fen greater than 0.5ha where one or more of the following NVC communities is present and meet the quality thresholds in Table 10:

M4, M5, M9, M17, M18, M19, M21, M29, S1, S25, S27

APPLICATION

This guideline can be applied to any valley or basin fen which meets the quality and size criteria, provided they are hydrologically sustainable. Of particular importance are fens which are relatively free of human modification, such as by drainage or nutrient enrichment.

Table 10 Habitat quality thresholds for basin and valley fens [37]

NVC communities	Quality Threshold
M4 *Carex rostrata – Sphagnum recurvum (falax)* mire M5 *Carex rostrata – Sphagnum squarrosum* mire M9 *Carex rostrata – Calliergon cuspidatum/giganteum* mire S27 *Carex rostrata – Potentilla palustris* swamp	At least 3 (6 for M9 and S27b) of the following species should be present, with at least 1 species from those in **bold**: ***Caltha palustris, Carex diandra, Carex nigra, Carex rostrata, Epilobium palustre, Equisetum fluviatile, Galium palustre, Mentha aquatica, Menyanthes trifoliata, Phragmites australis, Potentilla palustris, Sphagnum* spp.**, *Angelica sylvestris, Cardamine pratensis, Eriophorum angustifolium, Lysimachia vulgaris, Lythrum salicaria, Selaginella selaginoides, Succisa pratensis, Valeriana dioica, Viola palustris*
	At least 25% of the vegetation cover should be composed of the following species: *Carex* spp. (small to medium sized spp.), *Equisetum fluviatile, Hydrocotyle vulgaris, Hypericum elodes, Mentha aquatica, Menyanthes trifoliata, Potentilla palustris, Sphagnum* spp.
M17 *Scirpus cespitosus – Eriophorum vaginatum* mire M18 *Erica tetralix – Sphagnum papillosum* mire M21 *Narthecium ossifragum – Sphagnum papillosum* mire	At least 6 of the following species should be present and widespread: *Andromeda polifolia, Calluna vulgaris, Drosera* spp., *Erica* spp., *Empetrum nigrum, Eriophorum* spp., *Myrica gale, Narthecium ossifragum,* non-crustose lichens, pleurocarpous mosses, *Racomitrium lanuginosum, Rubus chamaemorus, Rhynchospora alba, Sphagnum* spp., *Trichophorum cespitosum, Vaccinium* spp.
	At least 50% of the vegetation cover should consist of at least 3 of the species listed above
M29 *Hypericum elodes – Potamogeton polygonifolius* soakway	Any occurrence of this vegetation qualifies for selection
S1*Carex elata* sedge-swamp	Any occurrence of this vegetation qualifies for selection
S25 *Phragmites australis – Eupatorium cannabinum* tall- herb fen	Any occurrence of this vegetation qualifies for selection

JUSTIFICATION

Basin and valley mires represent some of the most natural habitats present in Cumbria and support a range of communities and species not found in other habitats. All relatively unmodified examples merit protection. *Transition mires and quaking bogs* is listed in the EC Directive on the Conservation of Natural Habitats and Wild Fauna & Flora (EC Habitats Directive 1992) as a habitat type for which member states should designate Special Areas for Conservation (SAC). This vegetation is covered by the following UK BAP priority habitats: *lowland fens* and *upland flushes, fens and swamps*.

[37] Based upon JNCC. 2006. Common Standards Monitoring Guidance for Upland habitats. http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

GUIDELINE

Fe5 **Any series of flushes and/or springs meeting the quality thresholds in Table 11**

APPLICATION

This guideline can be applied to any series of springs or flushes. Generally it is not expected that individual flushes or springs will be selected, except for very exceptional cases, rather that groups of flushes and/or springs will be selected. By their nature springs and flushes are small features and it is not appropriate to have a size threshold for these features.

Table 11 Habitat quality thresholds for flushes and springs [38]

Spring-head, rill and flush	**Quality Threshold**
NVC communities: M31 *Anthelia julacea – Sphagnum auriculatum* spring M32 *Philonotis fontana – Saxifraga stellaris* spring M35 *Ranunculus omiophyllus – Montia fontana* rill M37 *Cratoneuron commutatum – Festuca rubra* spring M38 *Cratoneuron commutatum – Carex nigra* spring	At least 90% of the vegetation should be made up of one or more of the following: Any moss or liverwort species *Callitriche* spp., *Carex* spp., *Chrysosplenium oppositifolium, Cochlearia officinalis, Montia fontana, Potamogeton polygonifolius, Ranunculus omiophyllus, Saxifraga* spp.
	At least 1 of the following species should be present for the given NVC type: M31: *Anthelia julacea* M32: *Saxifraga stellaris, Philonotis fontana* M35: *Montia fontana, Ranunculus omiophyllus* M37 & M38: *Festuca rubra, Bryum pseudotriquetrum, Cratoneuron commutatum, C. filicinum*
Alkaline fen	**Quality Threshold**
All NVC communities:	75% of the vegetation cover should be composed of the species listed below: Any moss or liverwort spp., *Carex* spp — small to medium, size spp., *Eleocharis spp., Eriophorum* spp., *Menyanthes trifoliata, Saxifraga aizoides, Schoenus* spp.
NVC communities: M9a *Carex rostrata – Calliergon cuspidatum/giganteum* mire, *Campylium stellatum – Scorpidium scorpioides* sub-community	*Brown mosses*[39] plus at least 2 of the following species present: *Carex rostrata, Menyanthes trifoliata, Potentilla palustris*
M10 *Carex dioica – Pinguicula vulgaris* mire	*Brown mosses* plus at least 6 of the following species present: *Briza media, Carex dioica, Carex flacca, Carex hostiana, Carex viridula* ssp. *brachyrrhyncha, (C. lepidocarpa), Carex panicea, Carex pulicaris, Juncus articulatus, Juncus triglumis, Linum catharticum, Pinguicula vulgaris, Primula farinosa, Selaginella selaginoides, Thalictrum alpinum, Triglochin palustris*
M11 *Carex demissa – Saxifraga aizoides* mire	*Brown mosses* plus at least 2 of the following species present: *Blindia acuta, Carex viridula* ssp *oedocarpa (C. demissa), Saxifraga aizoides, Pinguicula vulgaris*
M13 *Schoenus nigricans – Juncus subnodulosus* mire	Any occurrence of this vegetation qualifies for selection

[38] Based upon JNCC. 2006. Common Standards Monitoring Guidance for Upland habitats. http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf

[39] *Brown mosses* are generally, though not exclusively, pleurocarpous mosses and include the following species: *Bryum pseudotriquetrum, Calliergon* spp., *Campylium stellatum, Cratoneuron* spp., *Ctenidium molluscum, Drepanocladus revolvens* and *Scorpidium scorpioides*.

Table 11 Habitat quality thresholds for flushes and springs [38]

Acid short sedge flushes	Quality Threshold
NVC communities: M4 *Carex rostrata – Sphagnum recurvum* mire M6 *Carex echinata – Sphagnum recurvum/auriculatum* mire	At least 3 of the following species should be present: *Cardamine pratensis, Drosera rotundifolia, Epilobium palustre, Euphrasia* sp., *Hydrocotyle vulgaris, Menyanthes trifoliata, Narthecium ossifragum, Pinguicula vulgaris, Potentilla palustris, Ranunculus flammula, Selaginella selaginoides, Succisa pratensis, Viola palustris*
M15a *Erica tetralix – Scirpus cespitosus* mire, *Carex panicea* sub-community	50% of the vegetation should be composed of the following species, with 25% of the total cover made up by those species in bold: ***Carex:* small to medium sized spp., *Hydrocotyle vulgaris, Potentilla palustris, Sphagnum* spp.,** *Drosera rotundifolia, Epilobium palustre, Eriophorum angustifolium, Euphrasia* sp., *Juncus articulatus, Menyanthes trifoliata, Narthecium ossifragum, Pinguicula vulgaris, Potentilla erecta, Ranunculus flammula, Selaginella selaginoides, Succisa pratensis, Viola palustris*

JUSTIFICATION

Springs and their associated flushes often occur in combination with grassland, heath, scrub, woodland and other habitats. Where they are unaffected by agricultural improvements they can support valuable and distinctive assemblages of species of mire, fen and spring-head habitats. These assemblages of species are unique to the ecological circumstances of the spring-head and associated flush community and are reliant upon the supply and quality of water arising from the local bedrock. *Alkaline fens* and *Petrifying springs with tufa formation (Cratoneurion)* are listed in the EC Directive on the Conservation of Natural Habitats and Wild Fauna & Flora (EC Habitats Directive 1992) as habitat types for which member states should designate Special Areas for Conservation (SAC), the latter being a priority habitat type. This vegetation is covered by the following UK BAP priority habitats: *lowland fens* and *upland flushes, fens and swamps*.

LOWLAND HEATH

GUIDELINE

LH1

Areas of 0.5ha or more below 250m AOD on mineral soils or peat less than 0.5m deep in which the following dwarf shrubs, either individually or in combination, have more than 25% cover:

Calluna vulgaris	**heather**
Vaccinium myrtillus	**bilberry**
Erica cinerea	**bell heather**
Erica tetralix	**cross-leaved heath**
Ulex gallii	**western gorse**

APPLICATION

Applies to both wet and dry heath in the lowland context. Where heath vegetation extends below 250m but is clearly part of an upland landform then the upland guidelines should be applied. Dune heathland may be included where not part of a larger dune system, but should generally be selected using the sand dune guidelines. Lowland grasslands which support greater than 25% cover of dwarf shrubs are considered to be lowland heath. Where dwarf shrub cover is less than 25% lowland grassland guidelines should be applied. Where dwarf shrubs are present on peat greater than 0.5m deep the swamp, fen and mire guidelines should be applied.

In Cumbria identification of lowland heath can be problematic as areas of heath may extend across the altitudinal limit set here and there may be little floristically to separate the two types. As a general rule contiguous areas of heath which straddle the 250m contour should be treated as upland heath in the Pennines and Lake District, but on the coastal plain of west Cumbria and the Solway, in the Eden Valley and on the Morecambe Bay limestone it should be treated as lowland heath.

Cumbrian lowland heath is often less diverse than the lowland heath found in southern England.

JUSTIFICATION

Lowland heath is a rare habitat nationally and is a UK BAP Priority Habitat and is rare in Cumbria.

INLAND ROCK

GUIDELINE

RoI

Areas of limestone pavement of 0.25ha or more supporting a deep grike flora with at least four species from Table 12

APPLICATION

Any area of limestone pavement greater than 0.25ha meeting the species threshold may be selected. The guideline is likely to select most limestone pavement, except those where there is no significant deep grike flora. All species used for qualification must be present in deep grikes for the pavement to qualify. The species listed are the most common species found in grikes on limestone pavements by Ward and Evans (1976)[40]. A deep grike is defined by Ward and Evans as one which is at least twice as deep as it is wide.

Table 12 Limestone pavement species

Anemone nemorosa	wood anemone
Asplenium trichomanes	maidenhair spleenwort
Asplenium ruta-muraria	wall rue
Asplenium viride	green spleenwort
Cystopteris fragilis	brittle bladder-fern
Dryopteris filix-mas	male fern
Geranium robertianum	herb Robert
Mercurialis perennis	dog's mercury
Mycelis muralis	wall lettuce
Oxalis acetosella	wood sorrel
Phyllitis scolopendrium	hart's tongue
Polystichum aculeatum	hard shield-fern
Viola riviniana	common dog violet

JUSTIFICATION

Limestone pavement is a rare habitat in Britain, Cumbria being one of only six counties in which it occurs. It is a refuge for a number of rare and uncommon species and is of outstanding scientific interest. *Limestone pavement* is a priority habitat in the UK and Cumbria BAPs and is listed on Annex I of the Habitats Directive. Most limestone pavements in Cumbria are legally protected from damage or disturbance of the limestone rock by Limestone Pavement Orders designated under the Wildlife and Countryside Act (1981).

[40] Ward, S.D. and Evans, D.F. (1976) Conservation Assessment of British limestone pavements based on floristic criteria. Biological Conservation 9, 217 - 233.

GUIDELINE

Ro2 Natural exposures of inland rock supporting outstanding examples of tall herb rock ledge, crevice or slope flora

APPLICATION

Eligible rock features will support at least one nationally or regionally (Cumbria) rare vascular or non-vascular plant species *or* an outstanding example of calcareous rock crevice or scree vegetation or tall herb ledge flora.

Normally site boundaries will be drawn around the whole crag or group of crags, not just an individual ledge, and may need to extend over surrounding areas of hillside beyond this where potential tall herb vegetation is present in surrounding grassland.

An outstanding example of a tall herb ledge will have either:

- At least six species from Table 13 present and at least 50% of the ledge vegetation made up of species from this table; or:
- At least five fern species (excluding bracken *Pteridium aquilinum*) and at least one dwarf-shrub species and greater wood-rush *Luzula sylvatica* and at least 50% of the ledge vegetation made up of ferns, dwarf-shrubs and greater wood-rush.

Table 13 Ledge species

Ajuga reptans	bugle
Alchemilla spp.	lady's mantles
Alchemilla wichurii	a lady's mantle
Anemone nemorosa	wood anemone
Angelica sylvestris	wild angelica
Antennaria dioica	mountain everlasting
Athyrium filix-femina	lady fern
Cirsium heterophyllum	melancholy thistle
Cochlearia officinalis	common scurvy-grass
Crepis paludosa	marsh hawk's-beard
Draba incana	hoary whitlow-grass
Dryopteris oreades	mountain male fern
Dryopteris spp.	male ferns
Filipendula ulmaria	meadowsweet
Galium boreale	northern bedstraw
Geranium sylvaticum	wood crane's-bill
Geum rivale	water avens
Heracleum sphondylium	hogweed
Hieracium spp.	hawkweeds
Hypericum spp.	St John's-worts
Leucanthemum vulgare	ox-eye daisy
Mercurialis perennis	dog's mercury
Oxyria digyna	mountain sorrel
Phegopteris connectilis	beech fern
Pimpinella saxifraga	burnet saxifrage
Potentilla crantzii	alpine cinquefoil
Potentilla neumanniana	spring cinquefoil
Primula vulgaris	primrose
Rubus saxatilis	stone bramble
Saussurea alpina	alpine saw-wort

Table 13 Ledge species	
Saxifraga hypnoides	mossy saxifrage
Sedum rosea	roseroot
Silene dioica	red campion
Solidago virgaurea	goldenrod
Succisa pratensis	Devil's-bit scabious
Thalictrum spp.	meadow-rues
Trollius europaeus	globe flower
Valeriana officinalis	common valerian

GUIDELINE

Ro3

Natural exposures of inland rock supporting outstanding examples of calcareous rock ledge, crevice or scree flora

APPLICATION

Eligible rock features will support at least one nationally or regionally (Cumbria) rare vascular or non-vascular plant species *or* an outstanding example of calcareous rock crevice or scree vegetation or tall herb ledge flora.

Table 14 Calcareous crevice and scree species	
Alchemilla alpina	alpine lady's mantle
Arenaria serpyllifolia	thyme-leaved sandwort
Asplenium viride	green spleenwort
Carex capillaris	hair sedge
Carex pulicaris	flea sedge
Ceterach officinarum	rustyback fern
Cystopteris fragilis	brittle bladder-fern
Dryas octopetala	mountain avens
Draba incana	hoary whitlow-grass
Dryopteris submontana	rigid buckler-fern
Gymnocarpium robertianum	limestone fern
Helianthemum nummularium	common rockrose
Hieracium spp.	hawkweeds
Koeleria macrantha	crested hair-grass
Minuartia verna	spring sandwort
Persicaria vivipara	alpine bistort
Polystichum aculeatum	hard shield-fern
P. lonchitis	holly fern
P. setiferum	soft shield-fern
Saxifraga aizoides	yellow mountain-saxifrage
Saxifraga oppositifolia	purple saxifrage
Selaginella selaginoides	lesser clubmoss
Silene acaulis	moss campion
Thalictrum alpinum	alpine meadow-rue
Thymus polytrichus	thyme

Normally site boundaries will be drawn around the whole crag or group of crags, not just an individual ledge, and may need to extend over surrounding areas of hillside beyond this where potential tall herb vegetation is present in surrounding grassland.

An outstanding example of calcareous rock crevice or scree vegetation will have at least four species from Table 14.

It is not expected that siliceous rock crevice or scree vegetation will be selected under these guidelines unless they support a nationally or regionally rare species.

This guideline covers natural inland cliff faces, rock ledges, gorges and boulder fields. Coastal cliff and ledge habitats are not covered by these guidelines.

JUSTIFICATION

Inland rock outcrop and scree habitats is a priority habitat in the UK BAP and *Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels*, *Calcareous rocky slopes with chasmophytic vegetation*, *Calcareous and calcshist screes of the montane to alpine levels(*Thlaspietea rotundifolii*)*, *Siliceous rocky slopes with chasmophytic vegetation* and *Siliceous scree of the montane to snow levels (*Androsacetalia alpinae *and* Galeopsietalia ladani*)* are listed on Annex I of the Habitats Directive. Rock ledges, crevices and scree support a range of rare and uncommon species.

UPLAND HABITATS

GUIDELINE

Up1 **Large areas of dry heath, wet heath, blanket bog or montane heath and grassland habitat (typically represented by NVC types H8, H9, H10, H12, H18, H19, H21, M15, M16, M17, M18, M19, M20b, U10), which either individually or in combination normally exceed 200ha in size and meet the quality thresholds in Table 15**

APPLICATION

This guideline should be applied to large sites (normally greater than 200ha) that meet the quality thresholds[41] set out in Table 15. To qualify a site must meet all the quality guidelines for the principal habitats present on the site. The listed NVC communities should, either individually or in combination, form the majority of the vegetation on the site except where the site also meets selection criteria under habitat guidelines other than Up1.

This guideline should be applied to moorland habitats on land above the fell wall or moorland line. No definitive minimum size can be set; though in all likelihood small areas of these extensive upland habitats would not be appropriate, as they are unlikely to support the ecosystems that make upland habitats special. A guideline threshold of 200ha has been provided, but consideration should be given to the inclusion of smaller areas that form coherent topographic units, particularly where montane heath and grassland is present. The guideline should be applied to the quality of habitats, within the context of an identifiable block of moorland or fell.

When assessing potential upland CLWSs, as well as considering the extent and geographical and topographical situation of the moor or fell block, consideration should be given to the quality of the habitats over the majority of the site.

JUSTIFICATION

This guideline seeks to identify large areas of high quality upland moorland habitat which form coherent topographical features. The NVC communities listed in the guideline are those that represent high quality moorland habitat.

[41] Adapted from JNCC. 2006. Common Standards Monitoring Guidance for Upland Habitats (http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf).

Table 15 Habitat quality thresholds for upland habitats

Dry heath	**Quality Threshold**
NVC communities: H8, H9, H10, H12, H18 & H21	At least 50% of vegetation cover should consist of the following species: *Arctostaphylos uva-ursi, Calluna vulgaris, Empetrum nigrum, Erica* spp., *Racomitrium lanuginosum, Ulex gallii, Vaccinium* spp.; with at least 2 species (other than *Ulex gallii*) present
	At least 1 species of moss or liverwort or non-crustose lichen should be present (excluding *Polytrichum spp.* and *Campylopus spp.*).
Wet heath	**Quality Threshold**
NVC communities: M15 & M16	At least 20% of the vegetation cover should consist of ericoid dwarf shrubs.
	At least 50% of the vegetation cover should consist of the following species: *Calluna vulgaris, Carex* spp., *Drosera* spp., *Empetrum nigrum, Erica* spp., *Eriophorum angustifolium, Myrica gale,* non-crustose lichens, pleurocarpous mosses, *Racomitrium lanuginosum, Rhynchospora alba, Salix repens, Sphagnum* spp., *Trichophorum cespitosum, Vaccinium* spp.
Blanket Bog	**Quality Threshold**
NVC communities: M17, M18, M19 & M20b	At least 6 of the following species should be present and widespread: *Andromeda polifolia, Calluna vulgaris, Drosera* spp., *Erica* spp., *Empetrum nigrum, Eriophorum* spp., *Myrica gale, Narthecium ossifragum,* non-crustose lichens, pleurocarpous mosses, *Racomitrium lanuginosum, Rubus chamaemorus, Rhynchospora alba, Sphagnum* spp., *Trichophorum cespitosum, Vaccinium* spp.
	At least 50% of the vegetation cover should consist of at least 3 of the species listed above
Montane lichen and moss heath	**Quality Theshold**
NVC communities: U10 & H19	At least 66% of the vegetation cover should consist of the following species: *Alchemilla alpina, Carex bigelowii, Calluna vulgaris, Cetraria islandica, Cladonia arbuscula, Cladonia portentosa (= C. impexa), Cladonia rangiferina, Cladonia uncialis, Dicranum fuscescens, Empetrum nigrum, Erica* spp., *Juniperus communis* ssp. *nana, Polytrichum alpinum, Ptilidium ciliare, Racomitrium lanuginosum, Rhytidiadelphus loreus, Salix herbacea, Vaccinium* spp.

GUIDELINE

Up2

Areas of moor and fell supporting combinations and mosaics of the following habitats:

juniper scrub
broadleaved or yew scrub
remnant wood pasture
wooded ravines
tall herb ledge communities
fern rich slopes (not bracken)
heath
species-rich grassland
flushes
valley mires
tarns

APPLICATION

This guideline is aimed at selecting complex upland mosaics which often include areas of flushes, valley mires and small upland tarns, together with stands of scrub, particularly juniper scrub, and remnants of upland woodland, often only present as scattered trees or small stands of woodland or scrub.

Generally two or three of the above habitats should be present. However in exceptional circumstances stands of wood pasture or fern rich slope may be selected on their own where they exceed 1ha or 0.5ha respectively in area (note that separate guidelines apply for the selection of juniper scrub, tall herb ledges, flushes, valley mires and tarns). Sites may include substantial areas of relatively ecologically poor habitats such as acid grassland or bracken as a matrix between the habitats listed above.

No minimum size threshold is set, but by the nature of these sites it is unlikely that any will be less than 5ha and most will be in excess of 10ha in area.

JUSTIFICATION

These are some of the most structurally and ecologically diverse areas remaining in the uplands. Many previously similar areas have been converted to tracts of relatively uniform vegetation with little structural variety as a result of grazing and burning over many generations.

GUIDELINE

Up3

Fell sides showing altitudinal transitions from the valley floor through the sub-montane zone to the montane zone (where present)

APPLICATION

Under natural conditions the fell sides of Cumbria would show an altitudinal transition from the *forest zone* with woods of oak, ash and alder, ericaceous dwarf-shrub heaths, grassland and bracken, through a *sub-alpine zone* of birch and hazel woods, tall scrub, ericaceous dwarf-shrub heaths and tall herbs to the *low alpine zone* with prostrate dwarf-shrubs, dwarf-herbs, moss carpets and snow-bed grassland on the highest fells. (The *middle alpine high alpine* and *nival zones* present in Continental Europe are not found in Cumbria.) However throughout the bulk of the British uplands, including Cumbria, natural tree-line woodland and scrub has been

lost by historic clearance, grazing and burning. The upper limit of the woodland that remains is generally depressed well below its potential, natural limit. The true upper limit of tree growth is represented by scattered trees on crags and in other rocky places inaccessible to grazing animals. Woodland is generally fragmented and represented by scattered patches. In most areas in the uplands dwarf-shrub heath and grassland has replaced the natural woodland of both the sub-alpine and forest zones. Some habitats such as blanket bog are not restricted to particular zones.

In Cumbria truly natural altitudinal transitions are absent due to human intervention. For the most part woodland does not extend above the fell wall and is confined to the *forest zone* (<300m), but in a few instances enclosed or unenclosed woodland or scrub extends into the *sub-alpine zone* (300 – 500/600m). Transitions from *sub-alpine* (sub-montane) dwarf-shrub heath to *low alpine* (montane, >500/600m) dwarf-shrub, moss and grass heaths are also very rare in Cumbria as grazing and burning have reduced many fell sides to species-poor grasslands. Any significant example of these altitudinal successions may be selected, including partial transitions, due to their rarity. No minimum size threshold is given, however it is expected that most sites selected under this guideline will be greater than 20ha in size. Note that the altitudinal limits given here for the various altitudinal zones are for guidance only. In practice the altitudinal ranges of these zones can vary considerably from fell to fell depending on factors such as aspect and latitude.

JUSTIFICATION

These altitudinal transitions are rare in Cumbria. In addition to their intrinsic ecological and scientific interest they also provide potential pathways for the altitudinal migration of species resulting from global warming.

HABITAT MOSAICS

GUIDELINE

HM1

Sites of 1ha or more in size that support a combination of two or more habitats that are individually of at least borderline County Wildlife Site quality

APPLICATION

This guideline should be applied to any area supporting a mosaic of semi-natural vegetation. To qualify under this guideline sites must support two or more habitat types and meet one of the following conditions:

- At least two habitat types must be borderline for the relevant selection guidelines for the habitat types.
- At least one habitat type must be of borderline quality and the site also be of borderline quality for one or more species selection guidelines.
- The site is of borderline quality for two or more species groups.

The boundary of sites selected under this guideline should include any other wildlife features that add value to the site.

JUSTIFICATION

Individual habitat types that are part of the mosaic do not qualify as County Wildlife Sites in their own right either because they are too small, or because they do not support a sufficient number of indicator or characteristic species. In combination, however, these habitat types can support a significant diversity of habitats and species that can make a significant contribution to local biodiversity and nature conservation objectives.

GUIDELINE

HM2

Sites of 5ha or more in size that support a mosaic of the habitats listed in Table 16 that collectively have a habitat diversity score of 8 or more

APPLICATION

This guideline applies equally to semi-natural sites and to former industrial sites and other brownfield land. Grasslands and woodlands of known recently sown or planted origin are not eligible under this guideline.

JUSTIFICATION

Habitat mosaics are an important reservoir for biodiversity, particularly in parts of the county where good examples of individual habitats are scarce. They also have an intrinsic value in the variety of habitats and the

transitions between habitats that they contain. These provide important niches for species which depend on more than one habitat during the day, such as birds and bats, or depend on different habitats at different stages in their life cycles, such as amphibians and some invertebrates.

Table 16 Habitat mosaic scores

Habitat	Score
Ancient semi-natural woodland	4
Unimproved calcareous grassland	4
Unimproved lowland acid grassland	4
Unimproved neutral grassland	4
Wet heath or mire	4
Dry heath	3
Marsh or fen (species-rich)	3
Running water	2
Standing open water/and or swamp	2
Rough grassland and/or rush-pasture *	2
Scrub communities of more than 1 species	2
Secondary semi-natural woodland	2
Semi-improved grassland (acid, neutral or calcareous)	2
Tall coarse grassland and scattered scrub mosaic *	2
Inundation communities	1
Marsh or fen (species poor)	1
Other habitat types covered by these guidelines	1
Ruderal/bare ground communities	1
Scattered scrub *	1
Single species dominated scrub	1

* only count scattered scrub and tall/rough grassland once

Open Mosaic Habitats on Previously Developed Land, as identified in the UK Biodiversity Action Plan, will be considered on the basis of the various species (notably plants, reptiles, amphibians and invertebrates) and habitat features that they support under guidelines HM1, HM2, Sp1-5, Re1-3, Am1-5 and In1.

COASTAL HABITATS

GUIDELINE

Co1

All intertidal, supratidal and adjacent terrestrial habitats

APPLICATION

This applies to all areas of natural and semi-natural habitat of the coastal fringe of Cumbria, including coastal saltmarsh, coastal vegetated shingle, intertidal mudflats, intertidal boulder communities, *Sabellaria alveolata* reefs, maritime cliff and slopes, coastal sand dunes, and associated scrub, fen, flush and woodland. These habitats are all associated with coastal processes or are otherwise directly affected by the sea.

Of particular interest are areas where there is a natural or near-natural transition from maritime influenced habitats to truly terrestrial habitats, as along most of the coast there is an abrupt transition from maritime habitats to agricultural land, generally at the cliff top or either side of a sea wall.

It is recognized that this guideline covers most of the non-SSSI coast with semi-natural and natural habitat down to the mean low water mark on the seaward side.

The supratidal zone is the shore area immediately above the mean high water mark. The upper boundary of this zone is equivalent to the landward line of marine processes (i.e. the *storm surge limit* or *storm log line* that is the lower limit of strictly terrestrial vegetation such as mosses). These areas may be inundated as a result of exceptionally high tides, tidal damming and/or freshet conditions.

GUIDELINE

Co2

Areas of 0.5ha or more of natural and semi-natural habitats, including coastal vegetated shingle, maritime cliff and slopes, coastal sand dunes, and associated scrub, fen, flush and woodland

APPLICATION

This guideline applies to areas of coastal habitat above the mean high tide mark which have become physically isolated from either coastal process and/or other coastal habitats.

Of particular interest are areas where there is a natural or near-natural transition from maritime influenced habitats to truly terrestrial habitats, as along most of the coast there is an abrupt transition from maritime habitats to agricultural land, generally at the cliff top or either side of a sea wall.

JUSTIFICATION

The Cumbrian coast is one of the most important wildlife features in the county. Whilst large areas of intertidal area, sand-dune and saltmarsh are designated as SSSI there are still large areas of semi-natural vegetation along the coast which are not covered by the SSSI system, particularly areas of soft cliff and slope.

All areas of undeveloped coastal and intertidal habitat are considered to be of nature conservation interest for the plant and animal communities they support, as they collectively form a more-or-less continuous coastal complex. Many rare and uncommon species and habitats are associated with the Cumbrian coast.

FRESHWATER AND FISH

GUIDELINE

Fw1

Rivers with a high degree of naturalness in terms of their banks and channels

APPLICATION

Channel form should be generally characteristic of river type, with predominantly unmodified planform and profile with predominantly natural/semi-natural bank vegetation. Widened or deepened channels and sections of artificial and reinforced bank will generally be precluded from selection or where included will not constitute more than 10% of the total channel length.

See also general river wildlife sites application and justification below.

JUSTIFICATION

Rivers with a high degree of naturalness are rare and merit protection.

GUIDELINE

Fw2

Semi-natural rivers regularly supporting either:

5 of the following species:

Atlantic salmon *Salmo salar*
native brown/sea trout *Salmo trutta*
lamprey *Lampetra* spp and *Petromyzon marinus*
bullhead *Cottus gobio*
European eel *Anguila anguila*
otter *Lutra lutra*

or

3 of the above species plus white-clawed crayfish *Austropotamobius pallipes*

APPLICATION

This guideline can be applied to both rivers with a high degree of naturalness and rivers where there has been a moderate degree of channel or bank modification, provided that the species threshold is met.

River and brook lamprey are not distinguished as it is very hard to distinguish between the ammocoetes of these two species.

See also general river wildlife sites application and justification below.

JUSTIFICATION

Some relatively highly modified sections of river can support important breeding sites for the species listed in this guideline. Atlantic salmon, sea lamprey, brook lamprey, river lamprey, bullhead, otter and white-clayed crayfish are all listed in Annex II of the EU Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). Atlantic salmon, native brown trout/sea trout, sea lamprey, river lamprey, European eel, otter and white-clayed crayfish are all UK BAP priority species.

GUIDELINE

Fw3

Any watercourse, lake or tarn regularly supporting a spawning population of one of the following species:

sea lamprey *Petromyzon marinus*

allis shad *Alosa alosa*

twaite shad *Alosa fallax*

smelt *Osmerus eperlanus*

Arctic charr *Salvelinus alpinus*

vendace *Coregonus albula*

schelly *Coregonus autumnalis*

APPLICATION

Any watercourse or standing water body supporting regularly breeding populations of these species may be selected.

See also general river wildlife sites application and justification below.

JUSTIFICATION

These species have a restricted distribution in Cumbria and any site with a regularly breeding population is considered to be of Wildlife Site quality. Cumbrian rivers are important in the national and international context with regard to the conservation of the species listed in this guideline.

APPLICATION (all river wildlife sites)

The lateral boundaries of river Wildlife Sites should be defined in the same way as for river SSSIs[42]: *The core of the selected area should be the channel of the river and its banks. The upper slope of the bank is defined as the first (or major break) of slope. Where the channel alone is of interest, the boundary should follow the break of slope unless there is a demarcating feature on the ground such as a hedge, fence, wall tree-line or flood bank. Where extensive riparian vegetation occurs along the rivers banks, this should be included within the boundary if possible.* In addition areas of habitat associated with a river such as small areas of woodland, wetland or grassland should also be included within the boundary wherever possible.

The length of riverine Wildlife Sites should be consistent with the length of the qualifying feature (or the longest feature if there are multiple qualifying features). Sites designated for the presence of species assemblages or species should extend over the entire length of suitable habitat for the assemblage or species within which the species have been recorded. Short sections of modified channel should be included where

[42]JNCC (1998) Guidelines for selection of biological SSSIs. HMSO

unmodified sections supporting the qualifying species lie upstream and downstream. Long sections of highly modified channel should be excluded where they do not support habitat capable of supporting the qualifying species. Sections of highly modified channel greater than 1km should be excluded from sites, however such judgments will need to be made on a site by site basis.

Guideline Fw1 will apply largely to the upper sections of rivers, whilst Guideline Fw2 will apply to the middle and lower sections.

JUSTIFICATION (all river wildlife sites)

Cumbria has an exceptional range of river systems of high quality, most of which support rich marginal communities along the main river corridors and associated tributaries and populations of key BAP species. It is recognised that a very high proportion of Cumbria's rivers will qualify as Wildlife Sites. This is justified as Cumbrian rivers are important in the national and international context with regard to the conservation of the species listed in this guideline.

GUIDELINE

Fw4

Any lake, tarn, pond, reservoir or canal supporting at least the following numbers of submergent or floating species from Table 17:

Group B:	**5**
Group C1:	**4**
Group C2:	**9**
Group D:	**10**
Group E:	**12**
Group F:	**5**
Group G:	**7**
Group I:	**9**

APPLICATION

The majority of scoring species should be well distributed across the water body or at least locally frequent, for example in one or more bays. Lake group type is as defined by Duigan *et al.* (2006)[43] and can be keyed out using Table 18. Table 19 provides a summary of Duigan *et al.*'s classification of British lake vegetation. It should be noted that Groups A and H are not considered to merit selection as County Wildlife Sites, whilst all Group J lakes in Cumbria are within SSSIs. If any undesignated Group J lakes are found then these should be selected as County Wildlife Sites, unless they are highly degraded, as this lake group is very rare in Cumbria.

JUSTIFICATION

These are the most diverse standing waters in Cumbria in terms of their aquatic flora and merit protection.

[43] Duigan, C. Kovach, W and Palmer, M. 2006. Vegetation communities of British Lakes: a revised classification. JNCC.

GUIDELINE

Fw5

Any lake, tarn or pond whose margins exhibit a high degree of naturalness with a well developed hydrosere and at least the following numbers of submergent or floating species from Table 17:

Group B:	**3**
Group C1:	**3**
Group C2:	**7**
Group D:	**8**
Group E:	**9**
Group F:	**4**
Group G:	**5**
Group I:	**7**

APPLICATION

Of particular interest are woodland fringes of alder and willow carr, extensive sedge beds and *Sphagnum* rafts and transitions to mire and fen.

Ideally the entire margin of the lake or tarn should be more-or-less natural, however in practice this is an unrealistic target, so for tarns some 50% of the margin should be unmodified, whilst for lakes significant sections of the margin (0.25 – 0.5km) should be more-or-less natural.

Lake Groups can be keyed out using Table 18.

JUSTIFICATION

The margins of many lakes and tarns have been modified by access or livestock grazing, consequently those which still retain significant areas of more-or-less natural transitions from open water to semi-natural terrestrial habitats are of particular nature conservation interest and merit protection.

GUIDELINE

Fw6

Any lake, tarn or pond with two or more emergent *Carex* species and at least the following numbers of submergent or floating species from Table 17:

Group B:	**3**
Group C1:	**3**
Group C2:	**7**
Group D:	**8**
Group E:	**9**
Group F:	**4**
Group G:	**5**
Group I:	**7**

APPLICATION

Where two or more *Carex* species are present both species should be at least locally frequent within the tarn. Where only small numbers of plants of one or both species of *Carex* are present the tarn should not normally be selected as a wildlife site, however exceptions to this may be made where uncommon species such as *Carex elata, C. aquatilis, C. acuta, C. lasiocarpa, C. limosa, C. magellanica* or *C. riparia* are concerned.

Lake Groups can be keyed out using Table 18.

JUSTIFICATION

Tarns with more than one species of emergent sedge are uncommon in Cumbria.

Table 17 Floating and submergent species

Scientific name	Common name	Scientific name	Common name
Apium inundatum	lesser marshwort	*Persicaria amphibia*	amphibious bistort
Baldellia ranunculoides	lesser water-plantain	*Pilularia globulifera*	pillwort
Callitriche hamulata	intermediate water starwort	*Potamogeton alpinus*	red pondweed
Callitriche hermaphroditica	autumnal water starwort	*Potamogeton berchtoldii*	small pondweed
Callitriche stagnalis	common water starwort	*Potamogeton crispus*	curled pondweed
Ceratophyllum demersum	rigid hornwort	*Potamogeton gramineus*	various pondweed
Chara spp*	stoneworts	*Potamogeton lucens*	shining pondweed
Elatine hexandra	six-stamened waterwort	*Potamogeton natans*	broad-leaved pondweed
Eleocharis acicularis	needle spike-rush	*Potamogeton obtusifolius*	blunt-leaved pondweed
Eleogiton (Scirpus) fluitans	floating club-rush	*Potamogeton pectinatus*	fennel pondweed
Fontinalis antipyretica	moss	*Potamogeton perfoliatus*	perfoliate pondweed
Glyceria fluitans	floating sweet-grass	*Potamogeton polygonifolius*	bog pondweed
Glyceria declinata	small sweet-grass	*Potamogeton praelongus*	long-stalked pondweed
Glyceria notata	plicate sweet-grass	*Potamogeton pusillus*	lesser pondweed
Groenlandia densa	opposite-leaved pondweed	*Potamogeton x nitens*	bright-leaved pondweed
Hippuris vulgaris	mare's-tail	*Potamogeton x olivaceus*	graceful pondweed
Isoetes echinospora	spring quillwort	*Potamogeton x zizzii*	long-leaved pondweed
Isoetes lacustris	quillwort	*R. aquatilis sens. lat.*	common water-crowfoot

Table 17 Floating and submergent species			
Scientific name	**Common name**	**Scientific name**	**Common name**
Juncus bulbosus fluitans	bulbous rush (submerged form)	*Ranunculus baudottii*	brackish water crowfoot
Lemna minor	common duckweed	*Ranunculus hederaceus*	ivy-leaved crowfoot
Lemna trisulca	ivy-leaved duckweed	*Ranunculus peltatus*	pond water-crowfoot
Limosella aquatica	mudwort	*Ranunculus penicillatus*	stream water-crowfoot
Littorella uniflora	shoreweed	*Ranunculus trichophyllus*	thread-leaved water-crowfoot
Lobelia dortmanna	water lobelia	*Sparganium angustifolium*	floating bur-reed
Luronium natans	floating water-plantain	*Sparganium emersum*	unbranched bur-reed
Myriophyllum alterniflorum	alternate water-milfoil	*Sparganium natans*	least bur-reed
Myriophyllum spicatum	spiked water-milfoil	*Sphagnum cuspidatum*	a bog moss
Nitella spp*	stoneworts	*Subularia aquatica*	awlwort
Nuphar lutea	yellow- water-lily	*Utricularia* spp*	bladderworts
Nymphaea alba	white water-lily	*Zannichellia palustris*	horned pondweed

* each individual species to be counted towards the total score

Table 18 Key to standing water site types using submerged and floating taxa.					
	Negative indicators (-1)	**Positive indicators (+1)**	**Score**	**Go to**	**Group**
1	*Juncus bulbosus*	*Potamogeton pectinatus* *Ruppia maritima*	1 or less 2 or more	2 -	- **J**
2	*Juncus bulbosus* *Lobelia dortmanna* *Littorella uniflora* *Myriophyllum alterniflorum* *Potamogeton polygonifolius* *Sparganium angustifolium*	*Lemna minor*	-1 or less 0 or more	3 4	- -
3	*Sphagnum* spp.	*Littorella uniflora* *Lobelia dortmanna* *Myriophyllum alterniflorum* *Potamogeton natans* *Potamogeton polygonifolius*	-1 0 or more	- 5	**A** -
4	*Lemna minor*	*Chara* spp. *Myriophyllum spicatum* *Potamogeton filiformis* *Potamogeton pectinatus* *Potamogeton pusillus*	1 or less 2 or more	6 -	- **I**
5	*Juncus bulbosus* *Lobelia dortmanna* *Potamogeton polygonifolius* (at least Occasional)	*Callitriche hamulata* *Fontinalis antipyretica* *Glyceria fluitans* *Nitella* spp.	0 or less 1 or more	7 8	- -
6	*Elodea canadensis* *Lemna minor* *Nuphar lutea* *Persicaria amphibia* *Potamogeton natans*	*Callitriche stagnalis* *Glyceria fluitans*	0 or less 1 or more	9 -	- **H**
7	*Sphagnum* spp.	*Isoetes lacustris* *Littorella uniflora* *Lobelia dortmanna* *Myriophyllum alterniflorum* *Sparganium angustifolium*	0 or less 1 or more	- 10	**B** **C**

Table 18 Key to standing water site types using submerged and floating taxa.					
	Negative indicators (-1)	**Positive indicators (+1)**	**Score**	**Go to**	**Group**
8	*Callitriche hamulata* *Nitella* spp.	*Chara* spp. *Potamogeton filiformis* *Potamogeton gramineus* *Potamogeton perfoliatus*	0 or less 1 or more	- -	**D** **E**
9	*Nuphar lutea* *Nymphaea alba* (at least Occasional)	*Glyceria fluitans* *Elodea canadensis* *Potamogeton crispus* *Potamogeton natans* *Potamogeton obtusifolius*	-1 or less 0 or more	- -	**F** **G**
10	*Sphagnum* spp.	*Littorella uniflora* (at least Occasional) *Lobelia dortmanna* (at least Occasional) *Myriophyllum alterniflorum* *Potamogeton natans* *Potamogeton polygonifolius* *Nymphaea alba*	0 or less 1 or more	- -	**C1** **C2**

The key is used to classify lakes using macrophyte data collected using the standard method described in Duigan *et al.* 2006.

Presence/absence records are used unless an indication of minimum abundance levels is given, according to the DAFOR scale. Score -1 for every record of a negative indicator; score +1 for every record of a positive indicator.

Table 19 Vegetation communities of British Lakes (Duigan *et al.* 2006)		
Ecotype	**Lake Group**	
Dystrophic lakes, with low plant diversity	Group A	Small, predominantly northern dystrophic peat or heathland pools, dominated by *Sphagnum* spp.
Heathland-associated soft waters in the lowlands and mountains, with low plant diversity	Group B	Widespread, usually low-lying acid moorland or heathland pools and small lakes, with a limited range of plants, especially *Juncus bulbosus, Potamogeton polygonifolius* and *Sphagnum* spp.
	Group C1	Northern, usually small to medium-sized, acid, largely mountain lakes, with a limited range of plants, but *Juncus bulbosus* and *Sparganium angustifolium* constant.
	Group C2	North western, predominantly large, slightly acid, upland lakes, supporting a diversity of plant species, *Juncus bulbosus* constant, often with *Littorella uniflora* and *Lobelia dortmanna*, in association with *Myriophyllum alterniflorum*.
Mid to low altitude lakes, with a diverse assemblage of plants	Group D	Widespread, often large, mid-altitude circumneutral lakes, with a high diversity of plants, including *Littorella uniflora*, *Myriophyllum alterniflorum, Callitriche hamulata, Fontinalis antipyretica* and *Glyceria fluitans*.
	Group E	Northern, often large, low altitude and coastal, above-neutral lakes with high diversity of plant species, including *Littorella uniflora, Myriophyllum alterniflorum, Potamogeton perfoliatus* and *Chara* spp.
Hardwater, lowland lakes, with low to moderate plant diversity	Group F	Widespread, usually medium-sized, lowland, above neutral lakes, with a limited range of species, but typified by water-lilies and other floating-leaved vegetation.
	Group G	Central and eastern, above neutral, lowland lakes, with *Lemna minor, Elodea canadensis, Potamogeton natans* and *Persicaria amphibia*.
	Group H	Northern, small, circumneutral, lowland lakes, with low species diversity characterised by the presence of *Glyceria fluitans* and *Callitriche stagnalis*.
Hardwater, lowland lakes with *Chara*	Group I	Widespread, mostly moderately large, base-rich lowland lakes, with *Chara* spp., *Myriophyllum spicatum* and a diversity of *Potamogeton* species.
Brackish water lakes	Group J	Northern coastal, brackish lakes, with *Potamogeton pectinatus, Enteromorpha* spp., *Ruppia maritima* and fucoid algae.

GENERAL SPECIES GUIDELINES

APPLICATION (all general species guidelines)

These guidelines apply to all species groups and are based on a hierarchy of conservation status which, more-or-less, follows that used by the Joint Nature Conservation Council (JNCC) for its Species Status Assessment project and Species of Conservation Concern list, with the addition of definitions of rarity at the Cumbria level.

These guidelines do not apply to birds.

GUIDELINE

Sp1

Any site which regularly supports a population of a species native to Cumbria listed as *critically endangered*, *endangered* or *vulnerable* in the relevant red data list or species review

APPLICATION

This guideline should be applied to any site with a population of these species. Where the species concerned occurs as a short term casual, the site should not normally be designated. Sites where there has been a recent, deliberate re-introduction, excluding where species have become established as part of a species recovery programmes, should also not normally be included.

As of 2007 the following red data lists and species reviews are considered to be current [source: JNCC spreadsheet of conservation designations for UK taxa (Taxon_designations_20070713.xls) available online at http://www.jncc.gov.uk/page-3409]:

Anon. 1991. A review of the scarcer Neuroptera of Great Britain.

Bratton, J.H. 1990. A review of the scarce and threatened Ephemeroptera and Plecoptera of Great Britain.

British Bryological Society. 2005. Bryophyte Red List.

Cheffings, C. and Farrell, L. (Eds). 2005. The Vascular Plant Red Data List for Great Britain. *Species Status* **7**: 1-116. JNCC (as revised in 2006: Leach, S. J. & Rusbridge, D. J. 2006. A tool for assessing the current conservation status of vascular plants on SSSIs in England. ENRR 690. English Nature.

Evans, S. 2006. The red data list of threatened British fungi. Preliminary assessment. British Mycological Society. http://194.203.77.76/fieldmycology/Download/RDL_of_Threatened_British_Fungi.pdf

Falk, S J. 1991. A review of the scarce and threatened bees, wasps and ants of Great Britain. Research & survey in nature conservation, No. 35. JNCC

Falk, S J. 1991. A review of the scarce and threatened flies of Great Britain - Part 1. Research & survey in nature conservation, No. 39. JNCC.

Falk, S.J. & Chandler, P.J. 2005. A review of the scarce and threatened flies of Great Britain. Part 2: Nematocera and Aschiza not dealt with by Falk (1991). Species Status 2: 1-191. JNCC.

Falk, S.J. & Crossley, R. 2005. A review of the scarce and threatened flies of Great Britain. Part 3: Empidoidea. Species Status 3: 1-136. JNCC.

Hyman, P. S. revised and updated by Parsons, M. S. 1992. A review of the scarce and threatened beetles of Great Britain Part 1 UK nature conservation, No. 3. JNCC.

Hyman, P. S. revised and updated by Parsons, M. S. 1994. A review of the scarce and threatened beetles of Great Britain Part 2 UK nature conservation, No. 12. JNCC.

Ing. B. 1995. Red data list of British fungi. JNCC (a review is currently being carried out by the British Mycological Society).

Kirby, P. 1992. A review of the scarce and threatened Hemiptera of Great Britain. UK nature conservation, No. 2. JNCC.

Parsons, M. S. 1993. A review of the scarce and threatened pyralid moths of Great Britain. UK nature conservation, No. 11. JNCC.

Parsons, M. S. 1995. A review of the scarce and threatened Ethmiidae, Gelechiidae and Stathmopodidae moths of Great Britain. UK nature conservation series, No. 16. JNCC.

Preston, C.D. 2006. A revised list of nationally scarce bryophytes. Field Bryology 90: 22-30.

Stewart, N. 2004. Review of the status of charophytes (stoneworts) (unpublished).

Wallace, I D. 1991.A review of the Trichoptera of Great Britain. Research & survey in nature conservation, No. 32. JNCC.

Woods, R.G. & Coppins, B.J. 2003. A conservation evaluation of British lichens, British Lichen Society, London.

Orthoptera: Shirt, D. B. (ed) 1987. Red Data Book of Insects. NCC.

Spiders and molluscs: Bratton, J. H. (ed) 1991. Red Data Book of Invertebrates. JNCC.

JUSTIFICATION

These are the most threatened species in the UK. Rare and threatened species are often not protected through habitat specific guidelines and to ensure that these important species do not decline any site supporting a species in one of the above categories can be selected as a Wildlife Site.

GUIDELINE

Sp2

Any site which regularly supports a significant population of a UK Biodiversity Action Plan *priority species*

APPLICATION

Several UK BAP *priority species* are common and widespread in Cumbria so it is not appropriate to select a site as a Wildlife Site simply for the presence of a *priority species*, rather the site must support a significant population of that species in either the UK or Cumbrian context. Given the large number of species on the *priority species* list it is not possible to give guidelines as to what constitutes a significant population for all species or groups, however the following guidelines are given.

- Where only small numbers of individuals are present then the site will not qualify under this guideline unless the species is rare either nationally or in Cumbria, in which case it should qualify under guidelines Sp1, Sp3, Sp4 or possibly Sp5.
- Reptiles: see Guidelines Re1 – Re3.
- Amphibians: see Guidelines Am1 – Am5.
- Mammals: any regularly breeding population of water vole *Arvicola terrestris*, dormouse *Muscardinus avellanarius*, harvest mouse *Micromys minutus* and potentially pine martin *Martes martes* is considered to be significant. Specific guidelines are given for bats (all species) and red squirrel in the Mammals

guidelines, whilst otter are covered by the Freshwater and Fish guidelines. Other mammal *priority species* are considered to be too widespread to justify the selection of Wildlife Sites at present, though this should be regularly reviewed.

- Vascular plants: with the exception of juniper, which is covered by the Woodland guidelines, all UK BAP *priority species* should qualify under guidelines Sp1, Sp3, Sp4 or Sp5.
- Non-vascular plants: specialist advice should be sought as to whether a site should be selected for a *priority species* non-vascular plant.
- Invertebrates: several *priority species* invertebrates are widespread in Cumbria and expert advice should be taken as to whether a site should be selected for a *priority species* invertebrate.
- Fish: see Freshwater and Fish guidelines.

JUSTIFICATION

UK BAP priority species are species which are globally threatened and rapidly declining in the UK and sites hosting significant populations merit selection as County Wildlife Sites as they make a significant contribution to the conservation of these species.

GUIDELINE

Sp3

Any site which regularly supports populations of two or more species native to Cumbria listed as *near threatened*, *nationally notable*, *nationally scarce* or *rare* in the relevant red data list or species review

APPLICATION

This guideline should be applied to any site with populations of two or more of these species. Where the species concerned occurs as a short term casual, the site should not normally be designated. Sites where there has been a recent, deliberate re-introduction, excluding species recovery programmes, should also not normally be included.

JUSTIFICATION

These species are in the second tier in terms of threat and rarity in the UK and merit protection where significant concentrations occur. Scarce and declining plant species are often not protected through habitat specific guidelines and to ensure that these important plant species do not decline any site supporting a plant in one of the above categories can be selected as a County Wildlife Site.

GUIDELINE

Sp4

Any site which regularly supports populations of two or more species native to Cumbria which are *rare* in the county

APPLICATION

Rare is defined as occurring in 10 or fewer tetrads in the county. This guideline should be applied to any site with populations of two or more of these species. Where the species concerned occurs as a short term

casual, the site should not normally be designated. Sites where there has been a recent, deliberate re-introduction, excluding species recovery programmes, should also not normally be included.

Due to incomplete survey coverage of groups such as invertebrates and lower plants expert advice should be sought on whether a species is truly rare in Cumbria, or just apparently rare due to under recording.

JUSTIFICATION

Locally rare plant species are vulnerable to local extinction and should be protected at their key sites.

GUIDELINE

Sp5

Any site which regularly supports five or more species native to Cumbria which are *scarce* in the county

APPLICATION

Scarce is defined as occurring in 11 to 60 tetrads in the county. This guideline should be applied to any site with populations of five or more of these species. Where the species concerned occurs as a short term casual, the site should not normally be designated. Sites where there has been a recent, deliberate re-introduction, excluding species recovery programmes, should also not normally be included.

Due to incomplete survey coverage of groups such as invertebrates and lower plants expert advice should be sought on whether a species is truly scarce in Cumbria, or just apparently scarce due to under recording.

JUSTIFICATION

Species included here whilst not immediately in danger of extinction in the County may, nevertheless, be at risk and could fall into the Rare category without adequate preventative measures.

LOWER PLANTS AND FUNGI

APPLICATION (all lower plant guidelines)

Lower plants include lichens and bryophytes (mosses and liverworts). For convenience, although not strictly speaking plants, fungi are also included within these guidelines. Quillworts, stoneworts and clubmosses are covered under the generic species guidelines.

Information on the distribution of these species is not as well recorded as vascular plants. Non-vascular plants require specialist survey skills and the presence of rare species should not be confirmed unless the record has been determined by a suitably qualified person.

Lower plants can have very restricted distributions, which can sometimes mean that a species is located on a single tree, stone, rock face, building or area of bare ground. Where this is the case, further surveys should be undertaken to determine if the species is more widely spread in the immediate vicinity of the record to help inform the identification of the boundaries of the County Wildlife Site. If further information is not available or the species concerned is very restricted, the County Wildlife Site boundary could be drawn to include other similar habitats within the immediate locality.

Lower plants will colonise a range of natural and man-made substrates. Houses and streets will not be eligible for selection.

It should be noted that determination of true rarity of fungi is problematic. Assessments tend to apply rarity criteria to occurrences of fruiting bodies. However, the relationship between rarity of fruiting bodies and the rarity of the species is generally unknown. Furthermore, the ephemeral nature and extreme fluctuations in the appearance of many fruiting bodies, makes the assessment of rarity and decline particularly complex. By basing an assessment on fruiting bodies, the work tends to focus on rarity of fruiting rather than rarity per se or on decline.

GUIDELINE

LP1

Any site supporting an assemblage of 5 or more species of Hyperoceanic or Oceanic bryophytes

APPLICATION

Any site with an assemblage of five or more Hyperoceanic or Oceanic bryophytes, as defined by Hill and Preston (1998)[44], should be considered. Table 20 lists the Hyperoceanic and oceanic species listed by Hill and Preston which occur in Cumbria. This includes species listed as Oceanic Boreal-montane, Oceanic Boreal-temperate, Hyperoceanic Temperate, Hyperoceanic Southern-temperate and Oceanic Southern-temperate.

[44] Hill, M.O. and Preston, C.D. 1998. The geographical relationships of British and Irish bryophytes. Journal of Bryology 20: 127-226.

Table 20 Oceanic bryophytes	
Adelanthus decipiens	*Lepidozia pearsonii*
Andreaea alpina	*Lophocolea fragrans*
Andreaea megistospora	*Marchesinia mackaii*
Andreaea mutablis	*Metzgeria leptoneura*
Aphanolejeunea microscopica	*Oedipodium griffithianum*
Breutelia chrysocoma	*Orthodontium gracile*
Bryum riparium	*Paraleptodontium recurvifolium*
Campylopus atrovirens	*Plagiochila atlantica*
Campylopus setifolius	*Plagiochilla punctata*
Colura calyptrifolia	*Plagiochilla spinulosa*
Dicranum scottianum	*Porella obtusata*
Drepanolejeunea hamatifolia	*Porella pinnata*
Fissidens curnovii	*Ptychomitrium polyphyllum*
Frullania microphylla	*Racomitrium ellipticum*
Frullania teneriffae	*Radula aquilegia*
Glyphomitrium daviesii	*Radula voluta*
Gymnomitrion crenulatum	*Rhabdoweisia crenulata*
Harpalejeunea ovata	*Saccogyna viticulosa*
Herbertus aduncus	*Scapania gracilis*
Herbertus stramineus	*Scapania ornithopodioides*
Jubula hutchinsiae	*Schistidium maritimum*
Lejeunea lamacerina	*Sphagnum austinii*
Lejeunea patens	*Sphagnum strictum*
Lepidozia cupressina	*Ulota phyllantha*

JUSTIFICATION

Communities of Hyperoceanic and Oceanic bryophytes are of international importance and are particularly well represented in western Britain, with Cumbria the main locus for these species in England and sites supporting significant assemblages of Hyperoceanic and Oceanic bryophytes merit selection.

Thresholds are based on a re-examination of data contained in Adams (1993)[45].

GUIDELINE

LP2

Any site supporting an assemblage of 4 or more species of Arctic-montane bryophytes from Table 21

APPLICATION

Any site with an assemblage of four or more Arctic-montane bryophytes, as defined by Hill and Preston (1998), should be considered. Table 21 lists the Arctic-montane species listed by Hill and Preston which occur

[45] Adams, T.H.L. 1993. Cumbria woods Atlantic bryophyte review. Unpublished report for English Nature Cumbria Team.

in Cumbria. This includes species listed as Suboceanic Arctic-montane, European Arctic-montane and Circumpolar Arctic-montane species. There are no Oceanic Arctic-montane species found in Cumbria.

Sites should form a coherent topographical unit.

Table 21 Arctic-montane bryophytes
Andreaea alpestris
Anthelia julacea
Aplodon wormskjoldii
Arctoa fulvella
Conostomum tetragonum
Ditrichum zonatum
Eremontus myriocarpus
Grimmia elongata
Gymnomitrion concinnatum
Hypnum hamulosum
Kiaeria falcata
Kiaeria starkei
Lophozia opacifolia
Lophozia wenzelii
Marsupella alpina
Philonotis tomentella
Pohlia ludwigii
Scapania uliginosa
Splachnum vasculosum

JUSTIFICATION

The mountains of Cumbria are the stronghold of these species in England and sites supporting significant assemblages of Arctic-montane bryophytes merit selection.

GUIDELINE

LP3

Any grassland where one or more of the following has been recently recorded:

- **scoring 30 or more from Table 22; or**
- **where 6 or more *Hygrocybe* species (waxcap fungi) have been recorded from a single visit; or**
- **9 or more *Hygrocybe* species have been recorded from multiple visits; or**
- **5 or more Clavariaceae species (club and coral fungi); or**
- **8 or more *Entomola* (pink-gilled agaric fungi) species; or**
- **2 or more Geoglossaceae (earthtongue fungi) species**

APPLICATION

The term *waxcap grassland* is used to describe grasslands supporting rich fungal assemblages comprising genera that are characteristic of nutrient-poor habitats. Waxcap (*Hygrocybe* spp.) species themselves are usually well represented and are probably the most visible group present but other fungal groups such as the fairy clubs (Clavariaceae), earthtongues (Geoglossaceae) and the genus *Entoloma* (pinkgills) are also indicative of this habitat.

Low nutrient status is the essential requirement for these grassland fungi, which are highly sensitive to soil enrichment from nitrate-based fertilizers. The underground fungi mycelia are thought to be slow-growing and species-rich sites must, therefore, have developed over long (several decade) timescales uninterrupted by detrimental actions such as ploughing or fertilisation. As a result, waxcap grasslands are usually indicative of unimproved and often ancient grassland sites.

Sites can be found across a range of grassland types with a history of low disturbance (from fertilizer or ploughing) and a short sward maintained by either grazing or mowing. Neutral grasslands of the MG5 NVC type and close-grazed acidic grasslands (often U4) often support waxcap populations and these sites are often also of high botanical interest. However grasslands with fairly poor higher plant diversity can also be good places for fungal diversity and as a result the nature conservation value of such sites may often have been overlooked or viewed as low.

Notable waxcap grasslands can occur in ridge and furrow pasture, providing that it is essentially unimproved. There appears to be a strong correlation here between the presence of adder's tongue fern *Ophioglossum vulgatum* and high counts of waxcap species. Good sites can also be found in churchyards, garden lawns, parkland and on golf courses.

Records should be from within the last five years unless it is clearly evident that habitat conditions remain favourable for these fungi, in which case records from 1960 onwards may be used with caution.

Scoring using Table 22 should be based on a single visit, ideally carried out during October and November. Scores from visits earlier in the year are likely to be lower than those carried out during this period.

Table 22 Waxcap grassland scoring system[46]		
Waxcaps (*Hygrocybe*)	**Cap colour**	**Score**
	White	2pts
	Orange/Yellow turning black (*H.conica*)	2pts
	Yellow (*H. chlorophana, glutinipes*)	2pts
	Green (*H.psittacina*)	2pts
	Light Brown (*H.pratensis*)	3pts
	Orange (*H. reidii; H. laeta*)	3pts
	Red (*H. coccinea, punicea, splendissima*)	7pts
	Pink (*H. calyptriformis*)	10pts
Other fungi		
Small brown/grey/white toadstools (<2cm cap diameter)		1pt
Toadstools on dung		1pt
Field mushrooms (*Agaricus*)		1pt
Puffballs		1pt (per species)
Large toadstools (>4cm diameter cap)		1pt (per species)
Pink gills (*Entomola*) narrow pink/off-white gills, white to brown caps		2pts (per species)
Earth tongues (black/dark green; tough)		5pts (per species)
Fairy clubs (yellow/white; fragile)		5pts (per species)
Purple Fairy Club *Clavaria zollingerii*		10pts

JUSTIFICATION

As with other unimproved grassland types, waxcap grasslands have experienced major declines in extent over the past 50 years due to agricultural improvement and any site with a significant waxcap or other grassland fungi population merits conservation and selection as a County Wildlife Site.

Threshold numbers of species for species groups are based on those suggested by Evans (2003)[47].

GUIDELINE

LP4 **Any woodland or parkland lichen site with an Index of Ecological Continuity equal to or greater than 20**

APPLICATION

The New Index of Ecological Continuity (NIEC) should be used in woodland and parkland sites. It is calculated by summing the number of lichen species listed in Table 23 which are present. Table 23 is derived from Coppins and Coppins (2002)[48]. The qualifying score includes species off the *main species* list plus species from the *bonus species* list. In addition, for sites within the Lake District, species from the additional list should be included. The species on the *main species* list are those for the New Index of Ecological Continuity, whilst

[46] From Griffith G W, Bratton J H & Easton G. 2004. Charismatic megafungi: the conservation of waxcap grasslands. British Wildlife 16 (1) 31-43

[47] Evans, S. E. 2003. Waxcap-grasslands an assessment of English sites. *English Nature Research Reports* Number 555. Peterborough.

[48] Coppins, A.M. and Coppins, B.J. 2002. Indices of ecological continuity for woodland epiphytic lichen habitats in the British Isles. British Lichen Society.

those in the *additional list* are those for the Eu-Oceanic Calcifuge Index of Ecological Continuity. Bonus species are additional significant local or rare species not included on the ecological continuity indices. Note that these are national lists and not all species necessarily occur in Cumbria.

Table 23 New Index of Ecological Continuity species		
Main species list		
Agonimia allobata	*Lecanora jamesii*	*Parmotrema crinitum*
A. octospora	*L. quercicola*	*Peltegera collina*
Anisomeridium ranunculosporum	*L. sublivescens*	*P. horizontalis*
Arthonia astroidestera	*Leptogium cyanescens*	*Pertusaria multipuncta*
A. ilicina	*L. lichenoides*	*P. velata*
A. vinosa	*L. teretiusculum*	*Phaeographis* sp. (excl. *P. smithii*)*
Bacidia biatorina	*Lobaria amplissima*	*Phyllopsora rosei*
Biatora epixanthoides	*L. pulmonaria*	*Porina coralloidea*
B. sphaeroides	*L. scrobiculata*	*P. hibernica*
Buellia erubescens	*L. virens*	*Punctelia reddenda*
Catinaria atropurpurea	*Loxospora elatina*	*Rinodina isidoides*
Cetrelia olivetorum s. lat.	*Megalospora tuberculosa*	*Schismatomma niveum*
Chaenotheca sp. (excl. *C. ferruginea*)*	*Micarea alabastrites or M. cinerea**	*S. quercicola* or *Pertusaria pupillaris**
Cladonia caespiticia	*M. pycnidiophora*	*Stenocybe septata*
C. parasitica	*Mycoporum antecellans*	*Stica fuliginosa* or *S. sylvatica**
Collema furfuraceum or *C. subflaccidum**	*Nephroma laevigatum*	*S. limbata*
Cresponea premnea	*N. parile*	*Strangospora ochrophora*
Degelia atlantica or *D. plumbea**	*Ochrolechia inversa*	*Thelopsis rubella*
Dimerella lutea	*Opegrapha corticola*	*Thelotrema lepadinum*
Enterographa sorediata	*O. prosodea*	*Usnea ceratina*
Heterodermia japonica	*Pachyphiale carneola*	*U. florida*
Lecanactis subabietina	*Pannaria conoplea* or *P. rubiginosa**	*Wadeana dendrographa*
Lecanographa amylacea	*Parmeliella parvula*	
L. lyncea	*P. triptophylla*	
Additional species for sites within the Lake District		
Bryoria bicolor	*H. laevigata*	*Mycoblastus caesius*
B. fuscescens	*H. sinuosa*	*M. sanguinarius*
Buellia griseovirens	*H. taylorensis*	*Ochrolechia tartarea*
Bunodophoron melanocarpum	*Lecidea doliiformis*	*Parmelinopsis horrescens*
Calicium lenticulare	*Leproloma membranaceum*	*Pertusaria ophthalmiza*
Cladonia luteoalba	*Megalaria pulverea*	*Sphaerophorus globosus*
Graphina ruiziana	*Menagazzia terebrata*	*Trapelia corticola*
Japewiella tavaresiana	*Micarea stipitata*	*Usnea filipendula*
Hypotrachyna endochlora		
Bonus species†		
Anaptychia ciliaris	*Cryptolechia carneolutea*	*Parmeliella testacea*
Arthonia anombrophila	*Fuscopannaria mediterranea*	*Parmotrema arnoldii*
A. anglica	*F. sampaiana*	*Platismatia norvegica*
A. zwackhii	*Hypotrachyna endochlora*	*Porina rosei*
Arthothelium dictyosporum	*H. sinuosa*	*Pseudocyphellaria crocata*
Bacidia circumspecta	*H. taylorensis*	*P. intricate*
B. subincompta	*Leptogium burgessii*	*P. norvegica*
Buellia hyperbolica	*Megalaria laureri*	*Pyrenula nitida s. str.*
Catillaria alba	*Menegazzia terebrata*	*Ramonia* sp. (excl. *R. interjecta*)*
Caloplaca herbidella	*Mycoporum lacteum*	*Rinodina colobinoides*
C. lucifuga	*Ochrolechia szatalaensis*	*Schismatomma graphioides*
Collema fragrans	*Opegrapha fumosa*	*Stricta canariensis* or *S. dufourii**

Table 23 New Index of Ecological Continuity species		
C. nigrescens	*Parmelinopsis horrescens*	*Teloschistes flavicans*
C. subnigrescens	*P. minarum*	*Usnea articulata*

* note that only one species is counted when alternatives or "sp." are given.

† this is a provisional list and additional species may be added from those listed as Critically Endangered, Endangered, Vulnerable or Near Threatened in Woods and Coppins (2003)[49]. This list is also available in the JNCC spreadsheet of conservation designations for UK taxa[50]

JUSTIFICATION

A number of Indices of Ecological Continuity (Coppins and Coppins, 2002) 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 with the past.

[49] Woods, R.G. & Coppins, B.J. 2003. A conservation evaluation of British lichens, British Lichen Society, London.

[50] Taxon_designations_20070713.xls available online at http://www.jncc.gov.uk/page-3409

MAMMALS

Other mammal species are covered by the general species guidelines.

GUIDELINE

Mal **Conifer woodlands greater than 200ha in size which regularly support red squirrel**

APPLICATION

Any site greater than 200ha regularly supporting red squirrel can be selected, including red squirrel refuges set up by conservation organisations.

JUSTIFICATION

200 adults is thought to be the minimum viable population size for red squirrels. In pine woodland red squirrel can be present in densities of 1 squirrel per hectare, so 200ha is the minimum viable woodland size. However in spruce plantations population density is much lower and 2,000ha is liable to be the minimum viable woodland size.

Cumbria is currently one of the few remaining strongholds of red squirrel in England, however it is not appropriate to select all woodlands for red squirrel as they are currently widely distributed in woodlands in the county and most significant broadleaved woodlands will be selected under the woodland guidelines. In addition, the red squirrel population is currently in a state of flux in the county and may disappear from much of the county in the next decade due to the spread of grey squirrel through the county.

GUIDELINE

Ma2a **Any hibernation site that regularly supports 2 or more species of bat or 10 or more individuals**

Ma2b **Any site that regularly supports roosts of 2 or more species of bat, except where both soprano pipistrelle and common pipistrelle are present, in which case 3 or more species should be regularly present**

Ma2c **Any breeding roost site that regularly supports a significant number of a bat species (see Table 24)**

Ma2d **Any autumn swarming site that regularly supports more than 50 bats**

Ma2e **Any site regularly used by a significant proportion of the local populations of 3 or more species of bat**

APPLICATION

These guidelines will not be applied to domestic dwellings. Other artificial structures for example, mine shafts, tunnels, bridges, commercial and industrial buildings, and historic monuments (except those that are also domestic dwellings), however, may be considered for designation. Individual trees or groups of trees may be selected.

Ma2a – Ma2c: a site may be any place used by bats for roosting. For summer and breeding roosts the site boundary may also include key feeding areas associated with the roost and flyways between them and the roost, where a discreet boundary can be identified. Key feeding areas are those locations bats from the roost regularly use for feeding and ones where they spend significant time feeding each night. Identifying key feeding areas for all species may not be possible or desirable, as some species feed over a wide area and in a variety of habitats. For other species, however, such as the Daubenton's bat, which feeds over lakes, rivers and canals, it may be appropriate to identify the appropriate water body. The selection of feeding areas for inclusion within the site should be based on survey information which clearly demonstrates the connection between the roost and the key feeding areas.

Ma2e: a site may cover just feeding areas or flyways and flightlines, or may be applied to roosts in a similar manner to that described above.

The guidelines are intended to identify and protect the most important regularly used or 'traditional' sites. It is not intended to cover sites that support low numbers of bats and/or roost sites, which are intermittently used.

Table 24 Numbers of bats that indicate a significant breeding roost in Cumbria

Bat species	Significant roost
Common pipistrelle *Pipistrellus pipistrellus*	100 or more animals
Soprano pipistrelle *Pipistrellus pygmaeus*	400 or more animals
Brown long-eared bat *Plecotus auritus*	30 or more
Noctule *Nyctalus noctula*	20 or more
Daubenton's bat *Myotis daubentonii*	20 or more
Natterer's bat *Myotis nattereri*	30 or more
Whiskered bat *Myotis mystacinus*	10 or more
Brandt's bat *Myotis brandtii*	10 or more

JUSTIFICATION

All species of British bat are protected under Section 9 of the Wildlife and Countryside Act 1981 (as amended) and Section 39 of The Conservation (Natural Habitats, &c.) Regulations. This protection is provided because all species of bat have declined significantly throughout the UK in the last 50 years. This decline has been brought about by a variety of factors, including reduction in habitat and subsequent habitat fragmentation, destruction of roost sites, either directly or through chemical treatment of roof timbers, and a reduction in insect food supplies arising from reduced habitat and extensive use of pesticides.

Bats have a low reproductive rate, and consequently breeding success is vital to the survival of populations. When there is a loss through the destruction of a breeding colony, the recovery rate is slow. Breeding success is affected by a variety of factors including the quality of roost site, weather conditions, food availability and disturbance of the roost site. Bats are very selective in their choice of breeding roosts and good quality roosts are utilised regularly over a long period of time. Such roost sites often provide a variety of environmental conditions, which the bats are able to utilise depending on the prevailing weather conditions. These roosts also are often close to, or well connected by, flyways to good feeding habitat. Feeding areas close to roosts are particularly important as it means the female adult bats can readily return to the roost on a regular basis during the night to suckle their dependent young.

Hibernation roosts are also important for the survival of a bat population and sites that provide suitable habitat for a variety of species of bat or large numbers of bats are particularly valuable. Hibernating bats require constant, undisturbed, cool but moist environments for hibernation, which will minimise the need for activity during the winter and hence the use of fat reserves. Like breeding roosts, some hibernation sites have been used regularly over many years.

BIRDS

APPLICATION (all bird guidelines)

The presence of breeding birds will be determined by field evidence including: sightings of the species in the same site throughout the breeding bird season, territorial (singing) male, pairs of birds, nest building activity, nests with eggs or chicks, birds carrying nesting material or faecal sacs.

Eligible sites will exclude domestic buildings whether or not they are in use. When determining the boundaries of a County Wildlife Site, consideration should be made of breeding and roosting sites.

For the purposes of these guidelines, 'regularly' will be judged by the species being recorded in at least 3 of the most recent 5 years for which data are available.

Where a species appears in threshold tables relating to more than one guideline the guideline with the lowest threshold should be applied unless stated otherwise. All species qualifying under a particular guideline are included in the relevant table, however not all those species will in practice allow the selection of a wildlife site under that guideline.

GUIDELINE

Any site which regularly supports more than 0.5% of the total 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, such as leks.

JUSTIFICATION

The threshold for the selection of nationally important sites (i.e. SSSIs) is 1% of the total British population. The threshold of 0.5% reflects county and regionally important sites for breeding birds and is generally recognised as reflecting a county/regional level of significance.

GUIDELINE

Bi2

Any site that regularly supports a significant breeding population of a species listed on the *Red List of Birds of Conservation Concern*[51] or as a *Priority Species* in the *UK Biodiversity Action Plan*

APPLICATION

A significant population is 0.5% of the total Cumbrian breeding population. Species to which this guideline may apply are listed in Table 25.

JUSTIFICATION

These are the rarest and/or most threatened birds in the UK and there is a national responsibility for their conservation.

Table 25 Red list and UK BAP Priority Species birds

Species	Cumbrian population*	Units**	Minimum threshold***
Hen harrier	0 - 4	P	1
Red grouse	2,500 – 3,000	P	14
Black grouse	185	M	1
Grey partridge	2,500	P	13
Quail	1 - 2	P	1
Corn crake	0 - 2	P	1
Lapwing	11,500	P	58
Curlew	10,500	P	53
Herring gull	10,000 – 13,000	P	58
Cuckoo	1,000	P	5
Nightjar	2 - 6	M	1
Lesser spotted woodpecker	10 - 15	P	1
Skylark	28,000	T	140
Tree pipit	14,000	T	70
Yellow wagtail	30 - 50	T	1
Dunnock	41,500	T	208
Ring ouzel	1,000	P	5
Song thrush	30,500	T	153
Grasshopper warbler	300	P	2
Wood warbler	2,500	M	13
Spotted flycatcher	12,000	T	60
Marsh tit	800	T	4
Willow tit	100	T	1
Starling	100,000	T	500
House sparrow	165,000	P	825
Tree sparrow	5,000 – 10,000	T	38
Linnet	46,500	T	233
Twite	50	P	1
Lesser redpoll	3,500	P	18
Bullfinch	1,500 – 2,000	T	9
Hawfinch	30 - 40	P	1

[51] Gregory, R.D, Wilkinson. N.I, Noble, D.G, Robinson, J.A, Brown, A.F, Hughes, J, Procter, D.A, Gibbons, D.W. and Galbraith, C.A. 2002. The population status of birds in the United Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002-2007. British Birds 95: 410-450.

Table 25 Red list and UK BAP Priority Species birds

Species	Cumbrian population*	Units**	Minimum threshold***
Yellowhammer	22,000	T	110
Reed bunting	1,500 – 2,000	T	9
Corn bunting	4 - 6	T	1

* data from The Breeding Birds of Cumbria[52]

** P = pairs; M = males; and T = territories

*** where a range is given for the Cumbrian population the median is used to calculate 0.5%.

GUIDELINE

Bi3

Any site which regularly support at least 10% of the county breeding population of species whose county breeding population is less than 100 breeding pairs

APPLICATION

Table 26 gives those species listed in The Breeding Birds of Cumbria as having fewer than 100 pairs breeding in Cumbria, however where more up to date information becomes available this should be used.

Table 26 Birds with a Cumbrian breeding population of less than 100 pairs

Species	Cumbrian population*	Units	10% of Cumbrian population**
Great crested grebe	90 - 110	P	10
Black-necked grebe	0 - 1	P	1
Fulmar	40 - 85	P	6
Wigeon	2 - 3	P	1
Gadwall	10 - 12	P	1
Teal	30 - 50	P	4
Shoveler	3 - 5	P	1
Pochard	3 - 5	P	1
Honey-buzzard	2 - 4	P	1
Hen harrier	0 - 4	P	1
Goshawk	10 - 15	P	1
Golden eagle	1	P	1
Osprey	1 - 3	P	1
Merlin	50	P	5
Peregrine falcon	90 - 100	P	10
Quail	1 - 2	P	1
Water rail	20 - 40	P	3
Corn crake	0 - 2	P	1
Little ringed plover	2 - 5	P	1
Dotterel	1 - 2	P	1

[52] Stott, M, Callion, J, Kinley, I, Raven, C and Roberts, J (eds.) (2002). The Breeding Birds of Cumbria. Cumbria Bird Club.

Table 26 Birds with a Cumbrian breeding population of less than 100 pairs

Species	Cumbrian population*	Units	10% of Cumbrian population**
Dunlin	15 - 25	P	2
Mediterranean gull	0 - 2	P	1
Common gull	0 - 1	P	1
Common tern	60 - 100	P	8
Arctic tern	60	P	6
Little tern	70 - 80	P	8
Black guillemot	4	P	1
Puffin	5	P	1
Long-eared owl	10 - 15	P	1
Short-eared owl	15 - 30	P	2
Nightjar	2 - 6	M	1
Kingfisher	50 - 100	P	8
Lesser spotted woodpecker	10 - 15	P	1
Rock pipit	20 - 40	P	3
Yellow wagtail	30 - 50	T	4
Fieldfare	0 - 1	P	1
Willow tit	100	T	10
Raven	80 - 110	P	10
Twite	50	P	5
Hawfinch	30 - 40	P	4
Corn bunting	4 - 6	T	1

* as recorded in The Breeding Birds of Cumbria

** where a range is given for the Cumbrian population the median is used to calculate 10%

P = pairs; M = males; and T = territories

JUSTIFICATION

These bird species are rare in Cumbria and merit protection.

GUIDELINE

Bi4

Any site which regularly supports a good assemblage of breeding bird species characteristic of the habitat in which they are recorded

APPLICATION

This guideline will be applied using Table 28. Qualifying sites will have scores which either equal or exceed that given for the habitat.

JUSTIFICATION

This guideline will identify rich-assemblages of bird species characteristic of particular habitats in a county context. The bird assemblages are based on Guidelines for the Selection of Biological Sites of Special Scientific

Interest[53], but have been modified for Cumbria. A small number of species which don't currently breed in the county have been included in the tables and are shown in *italics* on this basis that it is reasonably likely that they may do so in the near future. Species scores are based on a combination of their national Birds of Conservation Concern status, trends in extent in breeding ranges as shown in The Breeding Birds of Cumbria and rarity both nationally and in Cumbria (Table 27).

Table 27 Breeding bird assemblage species scoring scheme

Birds of Conservation Concern Status and Cumbrian population trend	Points
Green	1
Green plus a 0 to 25% contraction in breeding range in Cumbria[54]	2
Green plus a >25%, but < 50%, contraction in breeding range in Cumbria	3
Amber	3
Amber plus a > 50% contraction in breeding range in Cumbria	4
Red	4
Less than 300 breeding pairs in Cumbria (overrides lower scores)	4
Less than 1,000 breeding pairs nationally (overrides other scores)	5

[53] JNCC (1998) Guidelines for selection of biological SSSIs. HMSO

[54] Changes in breeding range measured as no. hectads (10km squares) in which breeding recorded in *The New Atlas of Breeding Birds in Britain and Ireland: 1988-91* (Gibbons, DW, Reid, J B, and Chapman, A R. 1993) compared with data from 1997-2001 given in *The Breeding Birds of Cumbria.*

Table 28 Breeding bird assemblages

Sand-dunes, salt-marshes, coastal grassland and shingle			
shelduck	3	little tern	4
eider	3	cuckoo	3
red-breasted merganser	4	short-eared owl	4
corn crake	5	rock pipit	4
oystercatcher	3	whinchat	1
ringed plover	4	stonechat	3
lapwing	3	wheatear	1
dunlin	4	skylark	4
snipe	3	sand martin	3
curlew	3	meadow pipit	3
redshank	4	grasshopper warbler	4
black-headed gull	3	sedge warbler	1
sandwich tern	4	linnet	4
common tern	4	reed bunting	4
Arctic tern	4		
Threshold site-index value:	**17**		

Lowland damp grassland See also guideline Bi5			
shelduck	3	redshank	4
gadwall	5	cuckoo	3
teal	4	short-eared owl	4
shoveler	4	yellow wagtail	4
quail	4	whinchat	1
corn crake	5	grasshopper warbler	4
lapwing	3	sedge warbler	1
snipe	3	reed bunting	4
curlew	3		
Threshold site-index value:	**11**		

Lowland fen without open water (where this habitat occurs in combination with open water, use the open waters list instead)			
little grebe	4	snipe	3
great bittern	5	cuckoo	3
gadwall	5	whinchat	1
teal	4	grasshopper warbler	4
shoveler	4	sedge warbler	1
pochard	5	reed warbler	4
marsh harrier	5	reed bunting	4
water rail	4		
Threshold site-index value:	**13**		

Table 28 Breeding bird assemblages

Open waters, rivers and their margins			
little grebe	4	ringed plover	4
great crested grebe	4	dunlin	4
black-necked grebe	3	snipe	3
great bittern	5	curlew	3
grey heron	4	redshank	4
mute swan	4	common sandpiper	2
greylag goose (non-feral)	3	black-headed gull	3
shelduck	3	common gull	4
wigeon	4	lesser black-backed gull	3
gadwall	5	common tern	4
teal	3	cuckoo	3
shoveler	4	kingfisher	4
pochard	5	sand martin	3
tufted duck	1	yellow wagtail	4
red-breasted merganser	4	grey wagtail	3
goosander	4	dipper	2
marsh harrier	5	grasshopper warbler	4
osprey	5	sedge warbler	1
water rail	4	reed warbler	4
oystercatcher	3	reed bunting	4
little ringed plover	4		
Threshold site-index value:	**23**		

Upland habitats			
little grebe	4	curlew	3
graylag goose (non-feral)	3	redshank	4
wigeon	4	common sandpiper	2
teal	4	black-headed gull	3
red-breasted merganser	4	common gull	4
goosander	4	lesser black-backed gull	3
hen harrier	5	cuckoo	3
buzzard	1	short-eared owl	4
golden eagle	5	skylark	4
osprey	5	meadow pipit	3
kestrel	3	grey wagtail	3
merlin	4	dipper	2
peregrine falcon	4	whinchat	1
red grouse	3	stonechat	3
black grouse	4	wheatear	1
dotterel	4	ring ouzel	4
golden plover	2	raven	4
dunlin	4	twite	4
snipe	3	reed bunting	4
Threshold site-index values:	**22**		

Table 28 Breeding bird assemblages

Lowland heath and raised mire			
quail	4	meadow pipit	3
snipe	3	tree pipit	3
curlew	3	whinchat	1
redshank	4	stonechat	3
cuckoo	3	wheatear	1
short-eared owl	4	grasshopper warbler	4
long-eared owl	4	whitethroat	1
nightjar	4	linnet	4
skylark	4		
Threshold site-index value:	**13**		

Scrub (excluding heath)			
cuckoo	3	garden warbler	1
long-eared owl	4	blackcap	1
nightjar	4	willow warbler	3
tree pipit	3	spotted flycatcher	4
dunnock	3	long-tailed tit	2
whinchat	1	linnet	4
stonechat	3	lesser redpoll	3
song thrush	4	bullfinch	4
grasshopper warbler	4	yellowhammer	4
lesser whitethroat	1	reed bunting	4
whitethroat	1		
Threshold site-index value:	**13**		

Woodland			
grey heron	4	garden warbler	1
honey-buzzard	4	blackcap	1
goshawk	5	wood warbler	3
sparrowhawk	1	chiffchaff	1
buzzard	1	willow warbler	3
osprey	5	goldcrest	3
black grouse	4	spotted flycatcher	4
woodcock	3	pied flycatcher	1
stock dove	3	long-tailed tit	2
cuckoo	3	marsh tit	4
tawny owl	2	willow tit	4
long-eared owl	4	coal tit	1
nightjar	4	nuthatch	1
green woodpecker	4	treecreeper	1
great spotted woodpecker	1	jay	2
lesser spotted woodpecker	4	raven	4
tree pipit	3	siskin	1
redstart	3	lesser redpoll	3
fieldfare	4	common crossbill	4
song thrush	4	bullfinch	4
mistle thrush	3	hawfinch	4
Threshold site-index value:	**21**		

GUIDELINE

Bi5

Any site comprising in-bye land or lowland permanent grassland which regularly supports six breeding pairs of two or more of the following wader species:

lapwing;

snipe;

curlew;

redshank; or

one pair of breeding yellow wagtail

APPLICATION

This guideline should be applied to individual fields or clusters of adjacent fields which are managed in a similar way. In general this guideline should only be applied to permanent grassland sites. Arable fields and short term leys should not be included.

JUSTIFICATION

Breeding wader and yellow wagtail populations have declined within the UK due to agricultural change, particularly field drainage. Remaining areas of suitable habitat are increasingly important for these species in Cumbria.

GUIDELINE

Bi6

Any site from which the following have been recorded:

a) 45 or more breeding bird species or

b) 60 or more breeding and wintering bird species or

c) 100 or more 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 habitats mosaics may be very valuable for birds, including sites which are of particular importance to passage migrants and winter visitors outside the breeding season.

GUIDELINE

Bi7

Any site that supports a significant population of a colonial nesting bird

APPLICATION

Sites supporting significant populations of bird species that nest colonially may be selected under this guideline. Table 29 gives minimum colony size thresholds for determining the significance of individual colonies.

Table 29 Significant colony size for colonial nesting birds

Species	Cumbria population*	No. colonies in Cumbria*	Minimum threshold (colony size pairs/nests)
Fulmar	40-80	2	5
Cormorant	120-150	4	5
Grey heron	270-300	37	10
Black-headed gull	6,000	51	500
Lesser black-backed gull	32-35,000	24	500
Herring gull	10-13,000	26	500
Greater black-backed gull	130-180	9	5
Kittiwake	1,000-1,500	1	100
Sandwich tern	300-380	1	5
Common tern	60-100	2	5
Arctic tern	60	1	5
Little tern	70-80	8	5
Guillemot	6,540	1	500
Razorbill	242	1	20
Black guillemot	8	1	2
Puffin	10	1	2
Sand martin	3,500-5,000	168	50
Rook	45,000	1,325	500

* data from The Breeding Birds of Cumbria

JUSTIFICATION

Birds that nest in colonies may be especially vulnerable to the loss of a site and where necessary these sites should be protected.

GUIDELINE

Bi8

Any site which regularly supports more than 0.5% of the total British non-breeding population of any native bird species

APPLICATION

Whilst this guideline is likely to be mainly applied to wintering populations, it can also be applied to other seasons.

JUSTIFICATION

The threshold for the selection of nationally important sites (i.e. SSSIs) is 1% of the total British population. The threshold of 0.5% reflects county and even regionally important sites for non-breeding birds and is generally recognised as reflecting a county/regional level of significance.

GUIDELINE

Bi9

Any site that regularly supports a significant non-breeding population of a species listed on the *Red List* of *Birds of Conservation Concern* or as a *Priority Species* in the *UK Biodiversity Action Plan*

APPLICATION

A significant population is 0.5% of the total Cumbrian non-breeding population. Currently the only county-wide data available for non-breeding birds are WeBS counts, however several red list and priority species to which this guideline apply are not covered by WeBS counts. Table 30 shows the thresholds for those species to which this guideline might apply based on WeBS data, plus provisional thresholds for species for which county-wide data is currently unavailable. Whilst raven and starling are included in Table 30 sites for these species should be selected under guideline Bi11 not Bi9 as the 0.5% threshold is considered inappropriate for these species.

Table 30 Red list and UK BAP Priority Species birds to which Guideline Bi9 may apply

Species	Cumbrian population*	Units**	Minimum threshold
Black-throated diver	1	1	1
Bittern***	3	1	1
Greater scaup	86	1	1
Black scoter	295	1	2
Hen harrier***	10	1	1
Grey plover	980	1	5
Whimbrel	116	1	1
Raven***	>200	1	1†
Starling***	>100,000	1	500†

* 2004/05 WeBS data.
** 1 = individuals
*** species not covered by WeBS counts
† threshold not to be used for selection, use Bi11 threshold instead

JUSTIFICATION

These are the rarest and/or most threatened birds in the UK and there is a national responsibility for their conservation.

GUIDELINE

Bi10 **Any site which regularly support at least 10% of the county non-breeding population of species with a county non-breeding population of fewer than 50 individuals**

APPLICATION

Table 31 Species where the Cumbrian non-breeding population is less than 50 individuals

Species	Cumbrian non-breeding population*	Units**	10% of Cumbrian non-breeding population
Red-throated diver	30	I	3
Black-throated diver	I	I	I
Great northern diver	I	I	I
Slavonian grebe	2	I	I
Shag	2	I	I
Bittern***	3	I	I
Little egret	4	I	I
Dark bellied brent goose	43	I	4
Light bellied brent goose	22	I	2
Gadwall	34	I	3
Long-tailed duck	5	I	I
Smew	5	I	I
Hen harrier***	10	I	I
Water rail	12	I	I
Little ringed plover	5	I	I
Dotterel P ***	20	I	2
Little stint P ***	3	I	I
Curlew sandpiper	8	I	I
Ruff	5	I	I
Jack snipe***	<50	I	4
Spotted redshank	I	I	I
Green sandpiper	2	I	I
Wood sandpiper	I	I	I
Arctic tern	15	I	2
Mediterranean gull***	10	I	I
Icelandic gull***	I	I	I
Glaucous gull***	2	I	I
Long-eared owl***	5	I	I
Short-eared owl***	20	I	2

* based on 2004/2005 WeBS data

** I = individuals

*** not covered by WeBS counts. Population figures are estimates

P on passage

Table 31 lists the species given in Birds in Cumbria as having non-breeding populations of less than 50 individuals, together with site thresholds for selection. This data is based on WeBS data as this is the only county wide data currently available, however not all the species listed are covered by WeBS counts. Provisional population estimates and thresholds are given for those species for which county-wide data is currently unavailable. Where more up to date information becomes available this should be used. It should be

noted that, for the most part, this table does not distinguish between passage and wintering populations and care should be taken when designating sites solely for passage populations.

JUSTIFICATION

These bird species are rare in Cumbria and merit protection.

GUIDELINE

Bi11

Any site which regularly supports a significant non-breeding population in Cumbria not included in Guidelines Bi8, Bi9 and Bi10

APPLICATION

This guideline may be applied to any site which regularly supports a significant proportion of the County's population of certain bird species at roosting, over-wintering, passage or other sites not used for breeding. Roosting and over-wintering populations should normally occupy the site for a minimum of six weeks per annum, whilst passage sites may, by necessity, be occupied for a shorter period. Birds to which this guideline might be applied are listed in Table 32, together with the appropriate thresholds.

Table 32 Species to which Guideline Bi11 applies

Species	Minimum threshold (individuals)
Hirundine flocks	300
Pied wagtail	50
Raven	20
Starling	2,000

JUSTIFICATION

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

REPTILES

GUIDELINE

Rel

Any site that regularly supports a *good* population of two or more reptile species as defined in Table 33

APPLICATION

The identification of site boundaries should take account of the area of habitat used by the species throughout the year. In particular, hibernation sites and favoured feeding habitat should be included.

Table 33 Assessment of reptile populations[55]

Species	Low population Score 1 point	Good population Score 2 points	Exceptional population Score 3 points
Adder	<5	5 – 10	>10
Grass snake	<5	5 – 10	>10
Common lizard	<5	5 – 20	>20
Slow-worm	<5	5 – 20	>20

Population counts refer to maximum number of adults seen by observation and/or under artificial refuges (placed at a density of up to 10 per hectare), by one person in one day

JUSTIFICATION

There are four species of reptile recorded in Cumbria:

Grass snake *Natrix natrix*
Adder *Vipera berus*
Common lizard *Lacerta vivipara*
Slow worm *Anguis fragilis*

The presence of *good* populations of two or more reptiles on one site is rare and is considered to merit protection.

[55] Table taken from Froglife 1999. Reptile Surveys. Advice sheet 10.

GUIDELINE

Re2

Any site that regularly supports a *good* population of grass snake or an *exceptional* population of common lizard, slow worm or adder as defined in Table 33

APPLICATION

The identification of site boundaries should take account of the area of habitat used by the species throughout the year. In particular, hibernation sites and favoured feeding habitat should be included.

JUSTIFICATION

Exceptional populations of any species of reptile are rare and merit protection. Grass snake is the rarest reptile in Cumbria, restricted to the warmer southern and western fringes of the county. Any *good* population of this species is of nature conservation significance in Cumbria and merits protection.

GUIDELINE

Re3

Any site that regularly supports a population of three or more reptile species and scores 4 or more for its reptile assemblage

APPLICATION

To determine the reptile assemblage score reference should be made to Table 33 and population counts must be made using the methodology set out in the table. The identification of site boundaries should take account of the area of habitat used by the species throughout the year. In particular, hibernation sites and favoured feeding habitat should be included.

JUSTIFICATION

As there are four species of reptile in Cumbria the presence of three or more reptiles is considered to represent a reptile site meriting protection, however at least one species must be present at the *good* population level to justify selection as a County Wildlife Site.

AMPHIBIANS

APPLICATION (all amphibian guidelines)

These guidelines are aimed at identifying and selecting important amphibian sites, excluding domestic gardens. As well as the presence and absence of species, the guidelines also utilise estimates of population sizes. These are based on the guidelines for the selection of SSSIs (JNCC 1998[56]) and the great crested newt mitigation guidelines (English Nature 2001)[57]. To rely on count data, adequately experienced personnel should gather information through surveys and data should be collected following the guidelines established for estimating population sizes of great crested newts.

The designation of sites should attempt to include both aquatic and terrestrial habitats of importance. Consequently, breeding sites should be included together with adjacent habitat known or likely to be used by the amphibian species for which the site is designated. Hibernation sites should be included wherever possible.

Where there are clusters of ponds they can be combined to form a single site. The ponds should not be separated by any obvious barriers and preferably connected by suitable amphibian terrestrial habitat. In general, water bodies within 100 metres of each other should be combined as a cluster. Where there are isolated ponds within 250 metres of the cluster they could also be considered for inclusion, if they are connected by amphibian terrestrial habitat, known to be used or likely to be used by amphibians.

Records should be from the last five years, however firm records more than five years old may be acceptable if the necessary conditions remain and the complete loss of the species at the site is in doubt.

GUIDELINE

Am1

Any site which regularly supports a *good* population of great crested newt *Triturus cristatus* as defined in Table 34

APPLICATION

A *good* population will be determined by reference to Table 34, which has been taken from JNCC 1998.

JUSTIFICATION

Great crested newt is protected by the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats etc.) Regulations. The protection reflects the fact that this species is vulnerable at a European level. Consequently, good populations of this species should be protected.

[56] JNCC (1998) *Guidelines for selection of biological SSSIs*. HMSO

[57] English Nature (2001). *Great crested newt mitigation guidelines*. English Nature

GUIDELINE

Am2 **Any site which regularly supports a population of natterjack toad *Bufo calamita***

APPLICATION

Any site supporting a population of the species within the last five years will qualify.

JUSTIFICATION

Natterjack toad is protected by the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats etc.) Regulations. The protection reflects the fact that this species is vulnerable at a European level. Consequently, good populations of this species should be protected. Cumbria is one of the main strongholds for this species in the UK, holding some 20% of the British population. All sites supporting this species should be protected.

GUIDELINE

Am3 **Any site that regularly supports five or more species of amphibian native to Cumbria**

APPLICATION

Records should be from the last five years, however firm records more than five years old may be acceptable if the necessary conditions remain and the complete loss of the species at the site is unlikely.

JUSTIFICATION

Seven species of native amphibian are recorded from the UK, all of which have declined in the UK over the last 50 years as a result primarily of habitat loss. Six amphibian species have been recorded from Cumbria, and therefore the presence of five species is considered to be a valuable assemblage of amphibians.

GUIDELINE

Am4 **Any site which scores 7 or more for its breeding amphibian species assemblage**

APPLICATION

To determine the amphibian assemblage score reference should be made to Table 34. The scores have to be for breeding sites surveyed during the breeding season following the guidelines set out in English Nature (2001).

JUSTIFICATION

Seven species of native amphibian are recorded from the UK, all of which have declined over the last 50 years, as a result, primarily of habitat loss. As well as number of species, the number of individual amphibians is also important in assessing the value of a site for amphibian species.

GUIDELINE

Am5

Any site supporting an *exceptional* population of an amphibian species

APPLICATION

An *exceptional* population will be determined by reference to Table 34.

JUSTIFICATION

Seven species of native amphibian are recorded from the UK, all of which have declined over the last 50 years, primarily as a result of habitat loss. Exceptional populations of any species of amphibian are rare and merit protection.

Table 34 Assessment of amphibian populations

Species	Method	Low population Score 1 point	Good population Score 2 points	Exceptional population Score 3 points
Great crested newt	Seen or netted in day	<5	5 – 50	>50
	Counted at night	<10	10 – 100	>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

INVERTEBRATES

APPLICATION (general)

Selection of sites for rare or threatened species is covered by the general species guidelines.

Previous selection guidelines for invertebrates have included a guideline covering Invertebrate Site Register sites grades A – C. This is no longer included as the ISR is no longer maintained and data is consequently out of date. However the general species guidelines should select the majority of ISR sites where they still support rare or threatened species.

GUIDELINE

In I

Any site which is of borderline County Wildlife Site quality for invertebrate species and supports four or more structural features of importance for invertebrates listed in Table 35

APPLICATION

This guideline should be applied to any area supporting a varied habitat structure of known importance for invertebrates, but which fails to meet one of the general species guidelines Sp1 – Sp5 due to a lack of recent species records (from within five years of site selection), or because there are fewer than three records within the last five years. *Known importance* is defined as a site for which there are historical records for one or more qualifying species and no apparent change in habitat type or quality since the date of that record. These sites will be identified in conjunction with an experienced invertebrate ecologist. The location and identity of the structural features used to select the site should be recorded on a map at the time of designation for future reference. It is recognised however that many of these features are transient in nature, but that on good invertebrate sites suites of these features will continue to be present, even if their location within the site changes.

Table 35 Features of structural importance for invertebrates

Fallen dead wood (wet and shady situations)	Sparsely vegetated or bare ground
Fallen dead wood (dry and open situations)	Hummocky ground in old disused quarries and brownfield sites
Dead standing timber	Earthworks
Old coppice stools	Loose hard substrates (e.g. rubble, brick or stone)
Woodland rides	Seasonally damp/wet areas
Pollards	Water margins (marginal mud, silt or sand)
Sap runs on trees	River shingle
Scattered scrub	River sandbanks
Grass tussocks	River backwater channels
Coarse tussocky grassland	Springs, seepages or pools
Varied sward heights	*Sphagnum* lawns
Flower rich grassland	Temporary pools
Presence of ant hills	Ditches
Slumping banks	South facing slopes
Coastal soft cliff	Steep slopes on banks
Coastal rock cliff	Inland rock faces or scree

Table 35 Features of structural importance for invertebrates	
Coastal shingle	Evidence of ruts & hoofprints (with continuity over several years)
Tidal refuse	Inland soft cliff/landslip
Caves	

JUSTIFICATION

Varied vegetation structure is important to invertebrates in every aspect and at every scale[58]. This is often not recognised as a valuable component of the nature conservation resource. Large, complex and varied sites are likely to support a significant invertebrate fauna, and as such are valuable as vegetation and invertebrate assemblages. This guideline can cover a range of UK BAP priority habitats including *Open Mosaic Habitats on Previously Developed Land*.

[58] Kirby, P. 1992. Habitat Management for Invertebrates: A practical handbook. Joint Nature Conservation Committee. Table 35 shows some of the features identified as important for invertebrates within this publication.

REFERENCES

Adams, T.H.L. 1993. Cumbria woods Atlantic bryophyte review. Unpublished report for English Nature Cumbria Team.

Anon. 1991. A review of the scarcer Neuroptera of Great Britain.

Biodiversity Reporting and Information Group. 2007. Report on the Species and Habitat Review. Report to the UK Biodiversity Partnership.

Bratton, J.H. 1990. A review of the scarce and threatened Ephemeroptera and Plecoptera of Great Britain.

Bratton, J. H. (ed) 1991. Red Data Book of Invertebrates. JNCC.

British Bryological Society. 2005. Bryophyte Red List.

Cambridgeshire and Peterborough County Wildlife Sites Partnership. 2007. Cambridgeshire and Peterborough County Wildlife Site System Handbook. May 2007 Draft.

Cheffings, C. and Farrell, L. (Eds). 2005. The Vascular Plant Red Data List for Great Britain. *Species Status* **7**: 1-116. JNCC

Coppins, A.M. and Coppins, B.J. 2002. Indices of ecological continuity for woodland epiphytic lichen habitats in the British Isles. British Lichen Society.

Cumbria BAP website: http://www.wildlifeincumbria.org.uk/cbap/habitat_biodiversity.asp

Cumbria County Council and Lake District National Park Authority. 2006. Cumbria and Lake District Joint Structure Plan 2001 – 2016 Adopted Plan, April 2006.

Cumbria Strategic Partnership. 2008. A Local Area Agreement for Cumbria 2008 – 2011. Draft. Submission to Government Office North West. 4th April 2008.

Cumbria Wildlife Trust. 2002. Provisional guidelines for the selection of wildlife sites in Cumbria.

Defra. 2002. Working with the grain of nature – a biodiversity strategy for England.

Defra. 2006. Local Sites. Guidance on their Identification, Selection and Management.

Defra. 2007. Conserving Biodiversity – The UK Approach.

Defra. 2007. Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London.

Department for Communities and Local Government. 2008. National Indicators for Local Authorities and Local Authority Partnerships: Handbook of Definitions.

Derbyshire Wildlife Trust. 2005. Derbyshire Wildlife Sites Handbook Volumes 1 and 2.

DETR. 2001. Countryside Rights of Way act 2000. DETR Circular 04/2001.

Duigan, C. Kovach, W and Palmer, M. 2006. Vegetation communities of British Lakes: a revised classification. JNCC.

English Nature. 2001. Great crested newt mitigation guidelines. English Nature.

Evans, S. E. 2003. Waxcap-grasslands an assessment of English sites. English Nature Research Reports Number 555. Peterborough.

Evans, S. 2006. The red data list of threatened British fungi. Preliminary assessment. British Mycological Society. http://194.203.77.76/fieldmycology/Download/RDL_of_Threatened_British_Fungi.pdf

Falk, S J. 1991. A review of the scarce and threatened bees, wasps and ants of Great Britain. Research & survey in nature conservation, No. 35. JNCC

Falk, S J. 1991. A review of the scarce and threatened flies of Great Britain - Part 1. Research & survey in nature conservation, No. 39. JNCC.

Falk, S.J. & Chandler, P.J. 2005. A review of the scarce and threatened flies of Great Britain. Part 2: Nematocera and Aschiza not dealt with by Falk (1991). Species Status 2: 1-191. JNCC.

Falk, S.J. & Crossley, R. 2005. A review of the scarce and threatened flies of Great Britain. Part 3: Empidoidea. Species Status 3: 1-136. JNCC.

Froglife 1999. Reptile Surveys. Advice sheet 10.

Gibbons, DW, Reid, J B, and Chapman, A R. 1993. The New Atlas of Breeding Birds in Britain and Ireland: 1988-91.

Government Office for the North West. 2006. Draft Submitted RSS for North West England.

Government Office for the North West. 2007. North West Draft Regional Spatial Strategy Examination in Public: Report of the Panel.

Gregory, R.D, Wilkinson. N.I, Noble, D.G, Robinson, J.A, Brown, A.F, Hughes, J, Procter, D.A, Gibbons, D.W. and Galbraith, C.A. 2002. The population status of birds in the United Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002-2007. British Birds 95: 410-450.

Griffith G W, Bratton J H & Easton G. 2004. Charismatic megafungi: the conservation of waxcap grasslands. British Wildlife 16 (1) 31-43.

Halliday, G. 1997. A Flora of Cumbria. University of Lancaster.

Hill, M.O. and Preston, C.D. 1998. The geographical relationships of British and Irish bryophytes. Journal of Bryology 20: 127-226.

Hopkins, J J, Allison, H M, Walmsley, C A, Gaywood, M and Thurgate, G. 2007. Conserving biodiversity in a changing climate: guidance on building capacity to adapt. Defra.

Hyman, P. S. revised and updated by Parsons, M. S. 1992. A review of the scarce and threatened beetles of Great Britain Part 1 UK nature conservation, No. 3. JNCC.

Hyman, P. S. revised and updated by Parsons, M. S. 1994. A review of the scarce and threatened beetles of Great Britain Part 2 UK nature conservation, No. 12. JNCC.

Ing. B. 1995. Red data list of British fungi. JNCC (a review is currently being carried out by the British Mycological Society).

IUCN. 2001. IUCN Red List Categories and Criteria: Version 3.1. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK. http://intranet.iucn.org/webfiles/doc/SSC/RedList/redlistcatsenglish.pdf)

JNCC. 1998. Guidelines for selection of biological SSSIs. HMSO

JNCC website: http://www.jncc.gov.uk/page-1775

JNCC. 2006. Common Standards Monitoring Guidance for Upland Habitats (http://www.jncc.gov.uk/pdf/CSM_Upland_Oct_06.pdf).

JNCC. 2007. Taxon_designations_20070713.xls available online at http://www.jncc.gov.uk/page-3409

Kelly, P G and Perry, K A. 1990. Wildlife Habitat in Cumbria. Research and Survey in Nature Conservation No. 30. Nature Conservancy Council. Peterborough.

Kirby, P. 1992. A review of the scarce and threatened Hemiptera of Great Britain. UK nature conservation, No. 2. JNCC.

Kirby, P. 1992. Habitat Management for Invertebrates: A practical handbook. Joint Nature Conservation Committee.

Lancashire Biological Heritage Sites Partnership. 1998. Biological Heritage Sites: Guidelines for Site Selection.

Leach, S. J. & Rusbridge, D. J. 2006. A tool for assessing the current conservation status of vascular plants on SSSIs in England. ENRR 690. English Nature.

Mitchell, A. F. 1974. A field guide to the trees of Britain and Northern Europe. Collins, London.

North Yorkshire SINC Panel. 2006. Sites of Importance for Nature Conservation in North Yorkshire: Guidelines for Site Selection.

Parsons, M. S. 1993. A review of the scarce and threatened pyralid moths of Great Britain. UK nature conservation, No. 11. JNCC.

Parsons, M. S. 1995. A review of the scarce and threatened Ethmiidae, Gelechiidae and Stathmopodidae moths of Great Britain. UK nature conservation series, No. 16. JNCC.

Preston, C.D. 2006. A revised list of nationally scarce bryophytes. Field Bryology 90: 22-30.

Ratcliffe, D.A. 1977. A Nature Conservation Review Volume 1. Cambridge University Press.

Read, H. 2000. Veteran trees: A Guide to good management. English Nature. Peterborough.

Robertson, H J and Jefferson, R G. 2000. Monitoring the condition of lowland grassland SSSIs. English Nature Research Report 315.

Shirt, D. B. (ed) 1987. Red Data Book of Insects. NCC.

Stewart, N. 2004. Review of the status of charophytes (stoneworts) (unpublished).

Stott, M, Callion, J, Kinley, I, Raven, C and Roberts, J (eds.) (2002). The Breeding Birds of Cumbria. Cumbria Bird Club.

Wallace, I D. 1991.A review of the Trichoptera of Great Britain. Research & survey in nature conservation, No. 32. JNCC.

Ward, S.D. and Evans, D.F. 1976. Conservation Assessment of British limestone pavements based on floristic criteria. Biological Conservation 9, 217 - 233.

Woods, R.G. & Coppins, B.J. 2003. A conservation evaluation of British lichens, British Lichen Society, London.