Guidance for the Selection of Sites of Nature Conservation Importance (SNCIs) in Surrey

May 2008
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(Photos on front page from top left clockwise: Chertsey Meads, Cucknells Wood, Nower Wood x2)

Part A: Introduction

Introduction

This document lays out guidance for the selection of Sites of Nature Conservation Importance (SNCIs) within Surrey. SNCIs in Surrey correspond to what DEFRA refer to as Local Wildlife Sites. The guidance has been produced following consultation with local experts, local authorities and conservation organisations.

These guidelines will be reviewed regularly in order to reflect increased scientific knowledge and the changing status of habitats and species in Surrey and the UK. We will aim to review this guidance at least every 5 years.

The selection of SNCIs in no way diminishes the importance of other areas of semi-natural habitat in Surrey, and it is recognised that all semi-natural habitat is important for wildlife and community value.

Acknowledgements

The production of these guidelines has involved a huge amount of help and advice from local conservation groups and experts. These include; members of the Surrey Nature Conservation Liaison Group particularly Claire Gibbs (Surrey Wildlife Trust), John Edwards (Surrey County Council), Isobel Girvan (Surrey Wildlife Trust), Jill Barton (Surrey Wildlife Trust), Simon Newell (Surrey Wildlife Trust), Sue Webber (Surrey Biodiversity Partnership) and Alistair Kirk (Surrey Biological Records Centre); members of the Surrey Habitat Action Plan groups including Wood Pasture & Parkland, Heathland, Woodland, Meadows and Wetlands, particularly Simon Elson (Surrey County Council), and Debbie Cousins and Dave Webb of the Environment Agency who were instrumental in revising the guidelines for rivers, open water and wetland habitats. In addition, the following groups and individuals have been instrumental in the production of the species guidelines; Surrey Amphibian and Reptile Group (particularly Gareth Matthes, Julia Wycherley & Richard Anstis), Surrey Bat Group (particularly Ross Baker and Lynn Whitfield), Surrey Bird Club (particularly Dave Smith), Butterfly Conservation (particularly Dan Hoare, Gail Jeffcoate and Tony Davis), Surrey Botanical Society (particularly Ann Sankey), Graham French (Natural England), David Baldock (aculeate expert), Dave Williams and Chris Matcham (Surrey Wildife Trust).

Background

Surrey is a county rich in a wide variety of habitats supporting an impressive range of biodiversity. The lowland heathland of the London Basin, the ancient woodland of the Low Weald and the chalk grassland of the North Downs are just a few examples.

Unfortunately much of Surrey's semi-natural habitat is under threat. Surrey is a county under immense pressure from development. Changes to agricultural practices, pollution, lack of management and the spread of invasive species also represent

significant threats to Surrey's wildlife. Surrey's internationally important sites are recognised and protected by European legislation in the form of Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar Sites under the Ramsar Convention. Sites of Special Scientific Interest (SSSIs) protect the nationally important sites. Surrey's SNCIs protect those sites of county, regional or national importance for wildlife that are not covered by these statutory designations.

Although not a statutory designation, SNCIs are protected through the planning process.

Section 40 of the Natural Environment and Rural Communities Act 2006 states that, *"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."* The SNCI network already greatly contributes to and has the potential to contribute further towards the targets within the UK and Surrey Biodiversity Action Plan.

Planning Policy Statement 9, Biodiversity and Geological Conservation (Office of the Deputy Prime Minister, 2005) states that " *Local sites, have a fundamental role to play in meeting overall national biodiversity targets; contributing to the quality of life and the well-being of the community; and in supporting research and education*". It also states that local development plans should include proposals for any development affecting such sites.

The Surrey Structure Plan (2004) states that there should be a presumption against development which directly affects SNCIs and that Local Development Frameworks should include policies to protect land of nature conservation value including SNCIs. All Local Development Frameworks should therefore include a policy to protect SNCIs.

In addition to protection through the planning process, the selection of a site as an SNCI is also beneficial in that it opens up the opportunity for positive conservation management advice to be given to the landowner.

Surrey Wildlife Trust was first commissioned by Surrey County Council to identify important sites for wildlife in Surrey for the Surrey Structure Plan in 1975. This led to the identification of Areas of High Ecological Quality (AHEQs). The project to compile a list of SNCIs for Surrey began in 1992 as a joint initiative between a number of organisations including Surrey County Council (SCC), Local Authorities, English Nature (EN), Environment Agency (EA), Farming and Wildlife Advisory Group (FWAG), Royal Society for the Protection of Birds (RSPB), the Surrey Biological Records Centre and Surrey Wildlife Trust (SWT). These organisations together make up the Surrey Nature Conservation Liaison Group (SNCLG), a sub-group of the Surrey Biodiversity Partnership. Other organisations such as Butterfly Conservation, Surrey Bird Club and Surrey Botanical Society as well as local experts are also consulted on a regular basis.

The Surrey Nature Conservation Liaison Group works with relevant Boroughs and Districts to identify sites of SNCI quality and recommend them to the local authority

for inclusion in the local plan, now local development framework. The SNCLG does not select SNCIs, but through the recommendation and inclusion in the development plan process they become selected when the relevant development plan is adopted.

Since 1992, 20,233 ha have been surveyed and 13,774 ha selected as SNCIs within Surrey.

Why revise the guidance?

The guidance described in this document replace those outlined in "Criteria for SNCI selection in Surrey" which was last updated in July 1997. The need to update the previous guidance was highlighted in a report reviewing the SNCI project in Surrey (Leech, 2003) and has become necessary due to a number of developments which are outlined below;

- Increases in our knowledge of species and habitats both locally and nationally.
- The development of national and local biodiversity action plans identifying species and habitats of priority for conservation.
- Increased appreciation of the need for habitat corridors due to concern about fragmentation of the countryside and the effects of global warming.
- Advice within the National Wildlife Sites Handbook (Hawkswell, 1997) and from DEFRA Guidance on Local Sites (DEFRA, 2006).
- The publication of Planning Policy Statement 9.

This document aims to provide a consistent rational for the evaluation and selection of SNCIs in Surrey. It recognises the need for the selection procedure to be consistent, robust and defendable. This is particularly important in Surrey where development threats are high. This document is also intended to be a public statement on the selection process for all interested parties.

As our knowledge of and the status of species and habitats within the UK and Surrey are constantly changing, this guidance will need to be under constant revision.

Procedure for selection of SNCIs

Sites can be identified as possible SNCIs using a number of information sources including aerial photographs, phase 1 habitat survey maps, the English Nature Ancient Woodland Inventory, local knowledge, in-house survey information and information received from other organisations and experts.

Following the identification of a possible SNCI, a survey will normally be undertaken. Prior to the survey of any site as part of the SNCI project, the landowner will be contacted and asked for permission to survey and for the site to be considered as an SNCI.

If permission is granted by the landowner, an ecological survey of the site will be carried out by an appropriately experienced person and a report written which will include the following;

- A general site description.
- Target notes and accompanying map describing the different habitat communities on the site.
- A description of the NVC communities thought to be present on the site (a full NVC survey is not normally undertaken due to lack of time).
- A summary of the past, current (if known) and suggested future management for the site.
- A summary of the nature conservation interest of the site.
- A botanical species list with abundances described using the DAFOR scale.
- A selection of digital photographs.

Where permission is refused, no survey will take place. In such cases, if there is enough information to suggest that a site could be of county importance for wildlife then the SNCLG may decide to select the site as a potential SNCI (pSNCI).

Often information may be obtained about a site from local experts such as Surrey Bird Club or Surrey Botanical Society or through other sources such as the Biological Records Centre. In such cases the information will only be used if it is in the public domain, for example as a result of a planning application, or if the landowner has agreed to the use of the information. Reasonable effort will be made to locate the landowner and inform them of the selection and the reasons behind it.

In most cases, a site already designated as a SSSI will not be considered for selection as an SNCI. In exceptional cases a SSSI will also be considered for selection as an SNCI but only if the reason for selection as an SNCI differs from that stated in the SSSI citation. For example, a SSSI designated for its geological importance may be selected as an SNCI for its wildlife value. Wherever possible where a SSSI supports features of particular value locally which have not been recognised by the SSSI citation, Natural England will be informed of these features so that they can be included as part of the management advice for the SSSI.

The recommended selection of SNCIs will be agreed by a panel of experts including the Surrey Nature Conservation Liaison Group and other organisations such as Butterfly Conservation, Surrey Bird Club and Surrey Botanical Society as well as local experts and the relevant District or Borough Council. Any area of land or water which satisfies this guidance is eligible for selection as an SNCI. It should be noted that the ecological value of a site is determined by many variables and there will always be the need for 'best professional judgement' in site selection. Selection should be based on reliable, up to date information.

SNCIs selected under the past guidance, "Criteria for SNCI selection in Surrey, July 1997" remain as SNCIs and will be reviewed against this new guidance only if they are re-surveyed. New sites will be selected and reviewed against this new guidance.

The assessment and selection of SNCIs is a continual process and new sites will be identified as scientific knowledge of individual sites and species increases.

The SNCLG will pass the recommended SNCIs to the Local Authorities for formal selection within the Local Development Framework. Adoption into the Local Development Framework will be subject to a consultation process which will enable landowners to comment on the selection of their land as SNCIs.

Wherever possible, the selection of new SNCIs will not occur on an adhoc basis, but will be undertaken as each borough undertakes its review process.

Determining Site Boundaries

Once a site has been assessed as being of SNCI quality, careful consideration will need to be given to the boundary of the selected area. The following aspects should be considered;

- Wherever possible the boundaries of an SNCI should follow clear physical boundaries on the ground for example a field or woodland edge. It is essential to define boundaries that can be located both on the ground and on maps to avoid confusion about the exact location and to assist later surveys.
- Care should be taken not to include significant areas of land which do not meet the selection guidelines, however it may be necessary for the future viability of the site to include some habitat that is of lesser value.
- For wetland sites it may be necessary to include an appropriate buffer zone or hydrologically linked habitats in order to maintain its ecological interest.
- Where sites are selected for the presence of a species, appropriate regard should be given to the habitat requirements of the species concerned throughout its life cycle. All the habitats required by a species throughout its lifecycle should be included if they are adjacent or in close proximity to each other.
- The justification for the definition of the boundary should be clearly recorded within the reasons for selection of the site.

Monitoring

Continual monitoring of the SNCI network is essential for the reasons outlined below;

- In order to assess the success of the SNCI project at protecting and maintaining sites.
- In order to pick up deterioration at an early stage so that advice can be given to landowners in an effort to halt it.
- In order to extend the depth of knowledge of a site's flora and fauna.
- In order to relate changes and losses in Wildlife Sites to wider factors, such as economic, political and social issues.
- In order to maintain the integrity of the SNCI system by removing sites which no longer meet the guidance and adding new sites which may have been missed at previous stages.

The monitoring of a site should involve the following;

- A re-survey of the site by an appropriately experienced person to check that the qualifying habitat or species are still present.
- Any decline in the quality of the habitat or population of relevant species should be noted.
- The boundaries of the SNCI should be checked during the monitoring procedure to ensure that the SNCI boundaries are the most appropriate.
- Ideally stable habitats such as woodland should be monitored every 10 years. Less stable habitats such as grassland and heathland should be monitored every 5 years.

Following the monitoring procedure, sites will be discussed by the SNCLG and relevant local experts. The SNCI boundary of each site will then be either confirmed or modified. In extreme cases where the SNCI has lost the interest for which it was selected the panel will need to consider the de-selection of the SNCI. The panel is unlikely do this where there is a reasonable chance that the interest of the site may be restored within a reasonable timescale.

Part B: Guidance for the selection of Sites of Nature Conservation Importance

SNCIs should be identified on account of their habitats or species, which are of county or regional wildlife value. The DEFRA guidance (DEFRA, 2006) states that local sites should select all areas of substantive nature conservation value.

The Ratcliffe Criteria is a long established and widely accepted method for determining the nature conservation value of a site (Ratcliffe, 1977). The criteria give general principles and factors to be taken into account when considering the nature conservation value of a site.

The general guidelines below are based upon the Ratcliffe Criteria and include those within the standard set of criteria recommended by DEFRA for consideration when defining Local Site criteria (DEFRA, 2006).

These guidelines should be used in conjunction with the more specific habitat and species guidance later in this document in order to assess the value of a site. Each of the guidelines below should not be used in isolation, but in conjunction with others. Knowledge, understanding and agreement amongst a panel of experts is required in order to make valid conclusions on the value of a site.

Sites which are close to, but do not quite meet the detailed habitat and species guidelines later in the report may be considered for selection where they are judged as important using the general guidelines below.

Section 1 General Guidelines for assessing the conservation value of a site

Rarity

- The presence of a rare or scarce habitat type or species should be a key factor in determining the selection of an SNCI. This should be considered in an international, national and local context. The selection should take into account cases where Surrey is a national stronghold for a species or habitat. Further specific details regarding the selection of SNCIs for rare species and habitats are given later in the document.

Diversity

- Sites of high diversity are generally considered to be more important than sites of lower diversity. However with regard to species diversity, some habitats are naturally more diverse than others. For example acid grasslands are intrinsically species poor where as chalk grasslands tend to be species rich. Therefore species diversity should be assessed in relation to the expected diversity for the habitat. Sites including a large number of locally native species will be considered for SNCI selection.

- Sites containing a mosaic of different habitats tend to be very important for wildlife. Diversity may be due to a range of habitat communities present on a site or to a range of microclimates such as varying vegetation height, areas of scrub, slopes and bare ground. There may be cases where none of the individual habitats on the site fully meet the guidance for selection as SNCI, but where the combined value may be sufficient to warrant selection.

Site Size

- As a general rule, larger areas of habitat are of greater value to biodiversity than smaller areas. In many cases this is due to larger areas having a greater diversity of habitats. Large areas are also more able to resist change. It is difficult to select a minimum size for SNCI selection. Some very small sites will support populations of very rare species. The minimum or optimal size of a site will vary according to habitat and will also vary according to the abundance of the habitat on a local, regional and national scale. The lower limit should be determined by the viability of the habitat unit. It is particularly important that this factor is considered in conjunction with other factors.

Naturalness

- In general, it could be argued that the nearer to being natural a site is, the higher the value that should be placed on it. However in Surrey there are very few habitats that have not been affected by people. Many of the important habitats within Surrey have been created and are maintained by man and are considered as semi-natural.

- Factors which would reduce the value of a site include the following;
  - Agricultural improvement.
  - Heavy modification of water courses.
  - The presence of non-native, particularly invasive species.

- However it must be noted that in some cases artificial habitats may be of high value for wildlife. For example, rare plants within arable land, bat hibernacular within a man-made structure and rare invertebrate species on brownfield sites. In such cases artificial habitats may be selected if they qualify under other guidance.

Typicalness

- In addition to protecting rare and vulnerable habitats and species it is also important that the SNCI network includes good examples of habitats typical of an area and helps to maintain viable populations of species typical of an area.

- Natural Area Profiles as developed by English Nature can be used to determine what habitats are typical in an area. Relevant Natural Areas within Surrey include London Basin, North Downs, Wealden Greensand, Low Weald and High Weald.

- Representative examples of typical and more commonplace habitats, e.g. ancient woodland which is relatively common in The Weald but is rare nationally should therefore be included.

Fragility

- Fragility can relate to the current extent and rarity of a habitat or species or to how vulnerable a site is to change or damage. For example woodlands are relatively stable where as grasslands are vulnerable to changes in management and wetlands to changes in water supply.

- The Wildlife Sites Handbook (Hawkswell, 1997) advises that "*Wildlife Sites should not be selected because of the degree of threat to a particular site. Nor should sites be excluded because there is considerable threat and the site is likely to be lost*."

- It is important to consider the fragility of a habitat when deciding the boundary of an SNCI. A buffer may be required to protect vulnerable habitats. It is also an important factor to consider when considering the direction of management resources and funds in the future.

Replacability

- Certain habitats cannot be replaced once they have been destroyed. The emphasis on site selection should be to protect these sites in preference to those which can be readily replaced.

Position in Ecological Unit / Connectivity within the Landscape

- Sites should not be looked at in isolation but their value should be considered as part of the wider landscape. The countryside has become increasingly fragmented and in a world with an unpredictable and changing climate, the presence of corridors and stepping stones linking habitats is particularly important.

- Planning Policy Statement 9 states that "Local Authorities should aim to maintain networks by avoiding or repairing the fragmentation and isolation of natural habitats".

- Sites linking other habitats or acting as stepping stones for example, hedgerows, rivers, canals, railway embankments and road verges are particularly important. These sites may not meet other guidance, but are important in their linking capacity.

- Sites adjacent to other important sites such as SNCIs or SSSIs which may act as protective buffers or join several otherwise isolated sites together are particularly important and should be considered for selection.

- Additional weight will be given to sites which form part of the proposed South East Ecological Network as described in "A Living Landscape for the South East, 2007".

- Sites which are linked to other sites through green corridors or mosaics are of greater value than similar isolated sites.

Educational Value & Value for the Appreciation of Nature

- The value of a site in providing an opportunity for contact with and enjoyment of nature and as a resource for learning about the natural world or for research into natural features and processes should not be underestimated. Sites which demonstrate a significant role in providing these functions should be considered for selection in combination with other guidance.

Potential Value

- When considering the value of a site, the potential value of the area can be taken into account.

- Sites should be considered for selection only if they have the potential to be of SNCI value, e.g. by a change of management or the cessation of damaging activities. This must be practically possible within a reasonable timescale (e.g. 5-10 years).

Recorded History and Cultural Associations

- Many sites have a long history of ecological recording and this can increase the importance of the site. Such records can be proof that a habitat is long established on the site and can yield useful scientific data about habitats, species or the effects of site management. Recorded history and cultural associations is particularly important for sites used for education and research.

- The recorded history and/or the cultural associations of a site can provide supplementary justification for selecting a site where it meets other guidance described in this document.

Section 2 Habitat Guidelines

This section is based on the Surrey Biodiversity Action Plan (BAP) (Surrey Biodiversity Partnership) which identifies the actions needed to conserve the wildlife of Surrey. The Surrey BAP draws from information within the English Nature Natural Area Profiles and ensures that national targets for species and habitats, as specified in the UK Biodiversity Action Plan, are translated into effective action at the local level. The recent review of the UK Biodiversity Action Plan has also been taken into account.

Where NVC communities are referred to in the guidance, these refer to the plant community types defined by J.S.Rodwell in British Plant Communities Volumes 1-5. The full name of the NVC communities used in the guidelines are given in Appendix 1.

1 Woodland

Sites which meet the following criteria should be considered for selection.

Criteria

a. All sites containing over 5ha of ancient semi-natural woodland (ASNW).

b. Other ancient woodland including plantations on ancient woodland sites where there is a significant element of the original semi-natural woodland surviving.

c. Areas of woodland which are not themselves ancient but which are immediately adjacent to ancient woodland sites should also be considered for selection.

d. Other semi-natural woodland will be considered for selection if it comprises important community types of restricted distribution in the county. This will include;

e. Wet woodland falling within NVC types; W1, W2, W4c, W5, W6 and W7
f. Lowland Beech, Yew and Box Woodland falling within NVC types; W12, W13, W14 and W15
g. Wealden gill woodland

h. Sites which support a significant population of a species as discussed in the species guidance.

Justification
ASNW contains a diverse flora and fauna which has evolved over many centuries. Between 1930 and 1997 there was a 12% loss of ancient woodland within Surrey (Surrey Biodiversity Partnership). Once destroyed ASNW is irreplaceable within a

reasonable timescale and therefore it is essential to protect the remaining sites within Surrey. The Surrey Habitat Action Plan for woodland includes the following action; "Continue with the identification and review of ancient woodland SNCIs".

Lowland beech and yew woodland and wet woodland are identified as priority habitats within the UK Biodiversity Action Plan. The NVC communities listed are those found within Surrey which are included within the UK Habitat Action Plans for wet woodland and Lowland beech and yew woodland. Woodland is included within the Surrey Biodiversity Action Plan which lists North Downs yew and box woods, Wealden gill woodland and shaws as locally and regionally distinctive.

Application

- Ancient woodlands are defined by Natural England as those where there is believed to have been continuous woodland cover since at least 1600AD.

- Where a wood is not indicated as ancient in the Inventory of Ancient Woodland for Surrey, it may be considered as ancient if;
  - it holds at least 10 ancient woodland indicator species,
  - it holds at least 5 ancient woodland indicator species and includes other features associated with ancient woodland e.g. well developed boundary banks and ditches, old/large coppice stools or veteran trees or other archaeological features or
  - there is other clear, specified evidence, that the woodland should be considered as ancient e.g. old maps, historical documents, the wood's name, shape, internal boundaries and location relative to other features.

2 Wood Pasture, Parkland & Veteran Trees

Sites which meet the following criteria should be considered for selection;

Criteria

a. Wood pasture and parkland over 2ha which can demonstrate 3 or more of the features defined below should be considered for selection.

b. Groups of 3 or more ancient or veteran trees (as defined below) within 0.25ha.

c. Sites which support a significant population of a species as discussed in the species guidance.

Justification

Lowland wood pasture and parkland is identified as a 'priority' habitat within the UK Biodiversity Action Plan and has been included within the Surrey Biodiversity Action Plan. The South East of England supports 70% of the UK's wood pasture and parkland and Surrey has more historic parks and gardens than any other part of Great Britain, with the exception of Greater London. Surrey is a stronghold for wood pasture and parkland and we have a national responsibility to protect this habitat. Wood pasture and parkland is included with the Surrey BAP. Actions within the Surrey HAP for wood pasture and parkland are to "*continue to notify wood pasture and parkland sites as SNCIs as appropriate"* and "*Ensure that all wood pasture and parkland of SNCI status are offered appropriate management advice".*

Veteran and ancient trees are an integral part of England's cultural and biological heritage. Once damaged or destroyed they are irreplaceable within our lifetime. Tree Protection Orders do not cover dead or dying trees and therefore it is important that they are given some form of protection. Groups of veteran trees are particularly important as they provide a number of alternative niches for wildlife and organisms that require precise micro-habitats are more likely to find enough to support viable populations.

Application

The definition of Wood Pasture and Parkland can be found in the Surrey Biodiversity Action Plan. The following list gives features indicative of wood pasture. Sites with **3** or more of the features below should be considered for selection;

- Old, particularly ancient trees are present at a density of at least one mature tree per hectare
- Old maps, records or oral evidence suggesting the historical presence of wood pasture or parkland on the site
- Historic or archaeological features typical of wood pastures
- Large herbivores particularly livestock present for at least part of the year,
- A tree/woodland structure showing the impact of large herbivores
- Evidence of working trees (pollards)
- A vegetation mosaic of open and wooded communities

- Multiple generations of trees present

A tree can be considered ancient or veteran where it has either;

- Hollowing in the trunk

and/or

- 3 or more out of the following 4 attributes;
    - Diameter at Breast Height (dbh) large for the tree species concerned*
    - Rot holes (these can develop through limb loss and bark wounds and are expanded by microorganisms & invertebrates) and/or rot sites (wood may be digested by the colonisation of rot holes by decay fungi).
    - Dead wood: extensive (larger than 20cm in diameter) standing or fallen dead wood.
    - Fungal fruit bodies: fruit bodies of fungi known to cause wood decay.

*The following dbh size categories can be used to determine the dbh is large for the tree species concerned (Smith & Bruce, 2004);

- 75cm: field maple, rowan, yew, birch
- 100cm: oaks, ash, Scot's pine, alder
- 150cm: sycamore, lime, horse chestnut, elms, poplar species, beech, willow, other pines.

When determining the boundary of the SNCI, consideration should be given to the need to include a buffer zone encompassing trees which could become veteran trees of the future. The boundary should include a buffer sufficient to protect the roots and mycorrhizal associations of the trees. British Standard 5837, 'Trees in relation to construction' gives guidelines as to the minimum distances for protective fencing around trees of varying age and diameter. This should be used as a minimum for the boundary of the SNCI.

Where a group of trees is selected the land in between should be included within the SNCI. The boundary should include adjacent mature trees as assemblages of species associated with ancients are also likely to be present on these nearby younger trees. These also will provide continuity of habitat by providing the next generation of ancient trees.

3 Traditional Orchards

Sites which meet the following criteria should be considered for selection;

Criteria

a. Traditionally managed orchards where;
- **a substantial number of the trees are old and have an abundance of dead wood and/or rot holes *or***
- **the trees support an important fungal or lichen flora *or***
- **the site supports other features of substantive nature conservation value such as unimproved grassland.**

b. Sites which support a significant population of a species as discussed in the species guidance.

Justification

Orchards have been recommended as a new UK priority habitat. Orchards were once widespread throughout the British Isles however pressure on land for development and the importation of cheap fruit from abroad has caused the loss of many small orchards. Orchard area in England has declined by 57% since 1950.

Culturally, orchards are very important having been central to community life. They represented cultural distinctiveness with over 200 varieties of apple once grown. Old orchards are known to be important for birds, bats, small mammals, invertebrates, fungi and lower plants such as lichens and bryophytes.

Application

Traditionally managed orchards refer to orchards managed in a low intensity way. Orchards managed intensively are likely to involve inputs of chemicals, 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.

4 Neutral Grassland

Sites which meet the following criteria should be considered for selection;

Criteria

a. All sites supporting the following NVC communities; MG4, MG5 or MG8.

b. Grassland sites which support a high diversity of species typical of grassland of conservation interest in Surrey. As a guideline, sites which support 15 or more of the species listed in Table 1 including at least 2 of the species in bold are likely to be of SNCI quality.

c. Sites which support a significant population of a species as discussed in the species guidance.

Justification

The UK Biodiversity Action Plan identifies lowland meadows as a priority habitat. All types of unimproved grassland have seen substantial declines in the 20th Century mainly due to changes in agricultural practices as well as development. The UK Biodiversity Action Plan estimates that there is only 15,000ha of species rich neutral grassland surviving in the UK today. Figures for the extent of neutral unimproved grassland within Surrey are currently unknown but low.

The Surrey Habitat Action Plan for Lowland Unimproved Neutral and Dry Acid Grassland includes the following actions;

- "*Continue to notify remaining unimproved grasslands as SSSI, SNCI and LNR where appropriate.*"
- "*Ensure all unimproved and good quality semi-improved neutral grasslands of SNCI status are offered appropriate management advice through the delivery of a prioritised program.*"
- *"Make effective use of the SNCI series to promote sensitive management of lowland meadows and roadside verges in Surrey."*

The NVC communities listed in the first criteria are those found within Surrey which are included within the UK Habitat Action Plan for Lowland Meadows. Sites which meet criteria 2 are likely to be diverse grasslands with species characteristic of unimproved conditions.

Application

A list of species typical of grassland of conservation interest in Surrey is shown in Table 1. Valuable grassland can be found in a range of situations. Some of the less obvious examples include churchyards, cricket pitches and roadside verges. Roadside verges are particularly important in acting as seed reservoirs of species for recolonisation of surrounding areas.

5 Acidic Grassland

Sites which meet the following criteria should be considered for selection;

Criteria

a. All sites supporting the following NVC communities; U1,U2, U3, U4 or U20a.

b. Grassland sites which support a high diversity of species typical of grassland of conservation interest in Surrey. As a guideline, sites which support 15 or more of the species listed in Table 1 including at least 2 of the species in bold are likely to be of SNCI quality.

c. Sites which support a significant population of a species as discussed in the species guidance.

Justification

The UK Biodiversity Action Plan identifies lowland dry acid grassland as a priority habitat. All types of unimproved grassland have seen substantial declines in the 20th Century mainly due to changes in agricultural practices as well as development. The UK Biodiversity Action Plan estimates that there is only 30,000ha of lowland dry acid grassland surviving in the UK today. Figures for the amount of acid grassland within Surrey are currently unknown but low.

The Surrey Habitat Action Plan for Lowland Unimproved Neutral and Dry Acid Grassland includes the following actions;

- "*Continue to notify remaining unimproved grasslands as SSSI, SNCI and LNR where appropriate.*"

The NVC communities listed above are those found within Surrey which are included within the UK Habitat Action Plan for Lowland Dry Acid Grassland. Sites which meet criteria 2 are likely to be diverse grasslands with species characteristic of unimproved conditions.

Application

A list of species typical of grassland of conservation interest in Surrey is shown in Table 1. Valuable grassland can be found in a range of situations. Some of the less obvious examples include churchyards, cricket pitches and roadside verges. Roadside verges are particularly important in acting as seed reservoirs of species for recolonisation of surrounding areas.

6 Calcareous Grassland

Sites which meet the following criteria should be considered for selection;

Criteria

a. All sites supporting the following NVC communities; CG2, CG3, CG4, CG5, CG6 or CG7.

b. Grassland sites which support a high diversity of species typical of grassland of conservation interest in Surrey. As a guideline, sites which support 15 or more of the species listed in Table 1 including at least 2 of the species in bold are likely to be of SNCI quality.

c. Sites which support a significant population of a species as discussed in the species guidance.

Justification

The UK Biodiversity Action Plan identifies lowland calcareous grassland as a priority habitat. The UK Biodiversity Action Plan estimates that there is only between 33,000 and 41,000ha of calcareous grassland surviving in the UK today. It is estimated that only around 324ha of chalk grassland remain in Surrey (*Surrey Biodiversity Partnership*).

The Surrey Habitat Action Plan for chalk grassland includes the following action;

- "*Seek to ensure safeguard of all non SSSI chalk grassland sites by non-statutory (SNCI) recognition".*

The NVC communities listed above are those found within Surrey which are included within the UK Habitat Action Plan for Lowland Calcareous Grassland. Sites which meet criteria 2 are likely to be diverse grasslands with species characteristic of unimproved conditions.

Application

A list of species typical of grassland of conservation interest in Surrey is shown in Table 1. Valuable grassland can be found in a range of situations. Some of the less obvious examples include churchyards, cricket pitches and roadside verges. Roadside verges are particularly important in acting as seed reservoirs of species for recolonisation of surrounding areas.

Table 1 – Species typical of grassland of conservation interest in Surrey

List developed by Surrey Botanical Society/BSBI, Natural England and Surrey Wildlife Trust

Species in bold: species that are currently on the Draft List of Vascular Plants that are Rare, Scarce or of Conservation Interest in VC17, Surrey.

Latin name	Common name
Orchis [Aceras] anthropophora	**Man Orchid**
Achillea ptarmica	Sneezewort
Agrimonia procera	Fragrant Agrimony
Aira caryophyllea	**Silver Hair-grass**
Aira praecox	Early Hair-grass
Ajuga chamaepitys	**Ground-pine**
Alchemilla filicaulis ssp. vestita	**Common Lady's Mantle**
Alisma plantago-aquatica	Water-plantain
Allium vineale	**Wild Onion**
Alopecurus aequalis	**Orange Foxtail**
Alopecurus geniculatus	Marsh Foxtail
Alopecurus x brachystylus	A. geniculatus x pratensis
Anacamptis pyramidalis	Pyramidal Orchid
Anagallis minima	**Chaffweed**
Anagallis tenella	**Bog Pimpernel**
Anchusa arvensis	Bugloss / Field Bugloss
Angelica sylvestris	Wild Angelica
Anthoxanthum odoratum	Sweet Vernal Grass
Anthriscus caucalis	**Bur Chervil**
Anthyllis vulneraria	**Kidney Vetch**
Aphanes australis	Slender Parsley-piert
Apium inundatum	**Lesser Marshwort**
Arabis hirsuta	**Hairy Rock-cress**
Arenaria serpyllifolia	Thyme-leaved Sandwort
Asperula cynanchica	Squinancywort
Astragalus glycyphyllos	**Wild Liquorice**
Barbarea vulgaris	Winter-cress
Berula erecta	Lesser Water-parsnip
Bidens cernua	**Nodding Bur-marigold**
Bidens tripartita	Trifid Bur-marigold
Blackstonia perfoliata	Yellow-wort
Brassica nigra	Black Mustard
Briza media	Quaking-grass
Bromopsis erecta	Upright Brome
Bromus commutatus	**Meadow Brome**
Bromus racemosus	**Smooth Brome**
Butomus umbellatus	**Flowering-rush**
Calamagrostis epigejos	**Wood Small-reed**
Calluna vulgaris	Heather / Ling / Common Heather
Caltha palustris	Marsh-marigold
Campanula glomerata	Clustered Bellflower
Campanula rotundifolia	Harebell
Cardamine pratensis	Cuckooflower
Carex acuta	**Slender Tufted-sedge**
Carex acutiformis	Lesser Pond-sedge

Latin name	Common name
Carex arenaria	**Sand Sedge**
Carex caryophyllea	Spring-sedge
Carex disticha	**Brown Sedge**
Carex elongata	**Elongated Sedge**
Carex filiformis	**Downy-fruited Sedge**
Carex flacca	Glaucous Sedge
Carex laevigata	Smooth-Stalked Sedge
Carex muricata subsp. lamprocarpa	Prickly Sedge
Carex nigra	Common Sedge
Carex otrubae	False Fox-sedge
Carex ovalis	Oval Sedge
Carex panicea	**Carnation Sedge**
Carex paniculata	Greater Tussock-sedge
Carex pilulifera	Pill Sedge
Carex riparia	**Greater Pond-sedge**
Carex rostrata	**Bottle Sedge**
Carex spicata	Spiked Sedge
Carex vesicaria	**Bladder-sedge**
Carex viridula subsp. oedocarpa	**Common Yellow Sedge**
Carex vulpina	**True Fox-sedge**
Carlina vulgaris	Carline Thistle
Catabrosa aquatica	**Whorl-grass**
Catapodium rigidum	**Fern-grass**
Centaurea scabiosa	Greater Knapweed
Centaurium erythraea	Common Centaury
Cerastium arvense	**Field Mouse-ear**
Cerastium diffusum	**Sea Mouse-ear**
Cerastium pumilum	**Dwarf Mouse-ear**
Cerastium semidecandrum	**Little Mouse-ear**
Chaenorhinum minus	**Small Toadflax**
Chamaemelum nobile	**Chamomile**
Cichorium intybus	**Chicory**
Cirsium acaule	Dwarf Thistle
Cirsium dissectum	**Meadow Thistle**
Cirsium eriophorum	**Woolly Thistle**
Clinopodium acinos	**Basil Thyme**
Clinopodium ascendens	**Common Calamint**
Clinopodium vulgare	Wild Basil
Conopodium majus	Pignut
Crassula tillaea	**Mossy Stonecrop**
Crepis biennis	**Rough Hawk's-beard**
Cuscuta epithymum	**Dodder / Lesser Dodder / Common Dodder**
Cynoglossum officinale	**Hound's-tongue**
Dactylorhiza fuchsii	**Common Spotted-orchid**
Dactylorhiza incarnata	**Early Marsh Orchid**
Dactylorhiza maculata	**Heath Spotted-orchid**
Dactylorhiza praetermissa	**Southern Marsh-orchid**
Dactylorhiza viridis	**Frog Orchid**
Dactylorhiza x grandis	**D. fuchsii x praetermissa**
Danthonia decumbens	Heath-grass
Daucus carota	Carrot
Dianthus deltoides	**Maiden Pink**

Latin name	Common name
Echium vulgare	Viper's-bugloss
Eleocharis acicularis	**Needle Spike-rush**
Eleocharis palustris	Common Spike-rush
Eleogiton fluitans	**Floating Club-rush**
Epilobium palustre	**Marsh Willowherb**
Epilobium tetragonum	Square-stalked Willowherb
Equisetum fluviatile	Water Horsetail
Equisetum palustre	Marsh Horsetail
Erica cinerea	Bell Heather
Erigeron acer	Blue Fleabane
Eriophorum angustifolium	Common Cottongrass
Erodium cicutarium	Common Stork's-bill
Erophila glabrescens	**Glaborous Whitlow-grass**
Erophila verna	Common Whitlow-grass
Euphrasia anglica	**Glandular Eyebright**
Euphrasia nemorosa	Common Eyebright
Euphrasia nemorosa x pseudokerneri	**E. nemorosa x pseudokerneri**
Euphrasia pseudokerneri	**Chalk Eyebright**
Festuca filiformis	Fine-leaved Sheep's Fescue
Festuca ovina	Sheep's-fescue
Festuca pratensis	**Meadow Fescue**
Filago lutescens	**Red-tipped Cudweed**
Filago pyramidata	**Broad-leaved Cudweed**
Filago minima	Small Cudweed
Filipendula ulmaria	Meadowsweet
Filipendula vulgaris	Dropwort
Fragaria vesca	Wild Strawberry
Galium palustre	Common Marsh-bedstraw / Marsh Bedstraw
Galium pumilum	**Slender Bedstraw**
Galium saxatile	Heath Bedstraw
Galium uliginosum	Fen Bedstraw
Galium verum	Lady's Bedstraw
Galium x pomeranicum	G. mollugo x verum
Genista anglica	**Petty whin**
Genista tinctoria	**Dyer's Greenweed**
Gentianella amarella	Autumn Gentian
Gentianella anglica	**Early Gentian**
Geranium columbinum	**Long-stalked Crane's-bill**
Geranium pratense	**Meadow Crane's-bill**
Geum rivale	**Water Avens**
Glyceria declinata	Small Sweet-grass
Glyceria notata	**Plicate Sweet-grass**
Gnaphalium sylvaticum	**Heath Cudweed**
Gymnadenia conopsea	**Fragrant Orchid**
Helianthemum nummularium	Common Rock-rose
Helictotrichon pratense	Meadow Oat-grass
Helictotrichon pubescens	Downy Oat-grass
Herminium monorchis	**Musk Orchid**
Hieracium agg.	Hawkweed (agg.)
Himantoglossum hircinum	**Lizard Orchid**
Hippocrepis comosa	**Horseshoe Vetch**
Hordeum secalinum	**Meadow Barley**

Latin name	Common name
Hydrocharis morsus-ranae	**Frogbit**
Hydrocotyle vulgaris	**Marsh Pennywort**
Hypericum humifusum	Trailing St. John's-wort
Hypericum maculatum	Imperforate St John's-wort
Hypericum montanum	**Pale St John's-wort**
Hypericum tetrapterum	Square-stalked St. John's-wort
Hypericum x desetangsii	H. maculatum x perforatum
Hypochaeris glabra	**Smooth Cat's-ear**
Inula conyzae	Ploughman's-spikenard
Isolepis setacea	**Bristle Club-rush**
Jasione montana	**Sheep's-bit**
Juncus acutiflorus	Sharp-flowered Rush
Juncus articulatus	Jointed Rush
Juncus compressus	**Round-fruited Rush**
Juncus conglomeratus	Compact Rush
Juncus squarrosus	Heath Rush
Knautia arvensis	Field Scabious
Koeleria macrantha sens. lat.	Crested Hair-grass
Lathyrus aphaca	**Yellow Vetchling**
Lathyrus linifolius	**Bitter-vetch**
Lathyrus nissolia	**Grass Vetchling**
Lathyrus pratensis	Meadow Vetchling
Lathyrus sylvestris	**Narrow-leaved Everlasting-pea**
Leontodon hispidus	Rough Hawkbit
Leontodon saxatilis	Lesser Hawkbit
Lepidium draba	Hoary Cress
Lepidium heterophyllum	**Smith's Pepperwort**
Leucanthemum vulgare	Oxeye Daisy
Leucojum aestivum subsp. aestivum	**Summer Snowflake**
Linaria vulgaris	Common Toadflax
Linum catharticum	Fairy Flax
Neottia/Listera ovata	Common Twayblade
Lithospermum officinale	**Common Gromwell**
Lotus corniculatus	Common Bird's-foot-trefoil
Lotus pedunculatus	Greater Bird's-foot-trefoil
Luzula multiflora	Heath Wood-rush
Lychnis flos-cuculi	**Ragged Robin**
Lysimachia nummularia	**Creeping-Jenny**
Lysimachia vulgaris	Yellow Loosestrife
Lythrum portula	**Water-purslane**
Medicago sativa subsp. falcata	**Sickle Medick**
Mentha pulegium	**Pennyroyal**
Mentha x smithiana	Tall Mint (M. aquatica x arvensis x spicata)
Mentha x verticillata	Whorled Mint (M. aquatica x arvensis)
Mentha x villosa	Large Apple Mint
Moenchia erecta	**Upright Chickweed**
Montia fontana	**Blinks**
Myosotis discolor	Changing Forget-me-not
Myosotis laxa	**Tufted Forget-me-not**
Myosotis ramosissima	Early Forget-me-not
Myosotis secunda	**Creeping Forget-me-not**
Myosoton aquaticum	Water Chickweed

Latin name	Common name
Myosurus minimus	**Mousetail**
Nardus stricta	Mat-grass
Nepeta cataria	**Cat-mint**
Odontites vernus	Red Bartsia
Oenanthe fistulosa	**Tubular Water-dropwort**
Oenanthe pimpinelloides	**Corky-fruited Water-dropwort**
Oenanthe silaifolia	**Narrow-leaved Water-dropwort**
Onobrychis viciifolia	**Sainfoin**
Ononis repens	Common Restharrow
Ononis spinosa	**Spiny Restharrow**
Ophioglossum vulgatum	**Adder's-tongue Fern**
Ophrys apifera	Bee Orchid
Orchis morio	**Green-winged Orchid**
Origanum vulgare	Wild Marjoram
Ornithopus perpusillus	Bird's-foot / Common Birdsfoot
Orobanche elatior	**Knapweed Broomrape**
Pastinaca sativa	Wild Parsnip
Pedicularis palustris	**Marsh Lousewort**
Pedicularis sylvatica	**Lousewort**
Persicaria bistorta	Common Bistort
Persicaria lapathifolia	Pale Persicaria
Persicaria minor	**Small Water-pepper**
Persicaria mitis	**Tasteless Water-pepper**
Petasites hybridus	**Butterbur**
Phleum bertolonii	Small Timothy
Phleum pratense	Timothy
Phyteuma orbiculare	**Round-headed Rampion**
Picris hieracioides	Hawkweed Oxtongue
Pilosella officinarum	Mouse-ear-hawkweed
Pimpinella major	**Greater Burnet-saxifrage**
Pimpinella saxifraga	Burnet-saxifrage
Plantago coronopus	Buck's-horn Plantain
Plantago media	Hoary Plantain
Poa angustifolia	Narrow-leaved Meadow-grass
Poa bulbosa	**Bulbous Meadow-grass**
Poa compressa	**Flattened Meadow-grass**
Poa humilis	**Spreading Meadow-grass**
Poa pratensis	Smooth Meadow-grass
Polygala calcarea	Chalk Milkwort
Polygala vulgaris	Common Milkwort
Potentilla argentea	**Hoary Cinquefoil**
Potentilla erecta	Tormentil
Potentilla palustris	**Marsh Cinquefoil**
Potentilla sterilis	Barren Strawberry
Primula veris	Cowslip
Primula vulgaris	Primrose
Pulicaria vulgaris	**Small Fleabane**
Radiola linioides	**Allseed**
Ranunculus bulbosus	Bulbous Buttercup
Ranunculus sceleratus	**Celery-leaved Buttercup**
Reseda lutea	Wild Mignonette
Rhinanthus angustifolius	**Greater Yellow-rattle**

Latin name	Common name
Rhinanthus minor	Yellow-rattle
Rorippa amphibia	**Great Yellow-cress**
Rorippa palustris	**Marsh Yellow-cress**
Rumex acetosa	Common Sorrel
Rumex acetosella	Sheep's Sorrel
Rumex hydrolapathum	**Water Dock**
Rumex pulcher	**Fiddle Dock**
Sagina apetala subsp. apetala	**Annual Pearlwort**
Sagina nodosa	**Knotted Pearlwort**
Salvia pratensis	**Meadow Clary**
Salvia verbenaca	**Wild Clary**
Sanguisorba minor subsp. minor	Salad Burnet
Sanguisorba officinalis	**Great Burnet**
Saxifraga granulata	**Meadow Saxifrage**
Scabiosa columbaria	Small Scabious
Scilla autumnalis	**Autumn Squill**
Scleranthus annuus	**Annual Knawel**
Scutellaria galericulata	Skullcap
Sedum acre	Biting Stonecrop
Senecio aquaticus	Marsh Ragwort
Senecio sylvaticus	Heath Groundsel
Serratula tinctoria	**Sawort**
Sherardia arvensis	Field Madder
Silaum silaus	**Pepper-saxifrage**
Solidago virgaurea	**Goldenrod**
Spergularia rubra	**Sand Spurrey**
Spiranthes spiralis	**Autumn Lady's-tresses**
Stachys officinalis	**Betony**
Stachys palustris	Marsh Woundwort
Stellaria graminea	Lesser Stitchwort
Stellaria neglecta	**Greater Chickweed**
Stellaria pallida	Lesser Chickweed
Stellaria palustris	**Marsh Stitchwort**
Stellaria uliginosa	Bog Stitchwort
Succisa pratensis	Devil's-bit Scabious
Tanacetum vulgare	Tansy
Teesdalia nudicaulis	**Shepherd's Cress**
Thalictrum flavum	**Common Meadow Rue**
Thesium humifusum	**Bastard-toadflax**
Thlaspi arvense	**Common Penny-cress**
Thymus polytrichus	Wild Thyme
Thymus pulegioides	Large Thyme
Torilis nodosa	**Knotted Hedge-parsley**
Tragopogon pratensis	Goat's beard
Trifolium arvense	Hare's-foot Clover
Trifolium campestre	Hop Trefoil
Trifolium fragiferum	**Strawberry Clover**
Trifolium glomeratum	**Clustered Clover**
Trifolium medium	**Zigzag Clover**
Trifolium micranthum	Slender Trefoil
Trifolium ornithopodioides	**Bird's-foot clover**
Trifolium scabrum	**Rough Clover**

Latin name	Common name
Trifolium striatum	**Knotted Clover**
Trifolium subterraneum	**Subterranean Clover**
Trifolium suffocatum	**Suffocated Clover**
Triglochin palustre	**Marsh Arrowgrass**
Trisetum flavescens	Yellow Oat-grass
Valeriana dioica	**Marsh Valerian**
Valeriana officinalis	Common Valerian
Verbascum thapsus	Great Mullein
Verbena officinalis	Vervain
Veronica anagallis-aquatica	**Blue Water-Speedwell**
Veronica officinalis	Heath Speedwell
Veronica scutellata	**Marsh Speedwell**
Vicia hirsuta	Hairy Tare
Vicia lathyroides	**Spring Vetch**

7 Heathland

Sites which meet the following criteria should be considered for selection;

Criteria

a. All areas of heathland vegetation; including matrices of dwarf shrub, bare ground, grassland, valley mires and scrub should be considered for selection. All areas containing over 2ha of heathland would automatically qualify as SNCIs.

b. Areas of heathland which are heavily afforested or have succeeded to mature woodland can be selected if they have potential to be restored to heathland and either;

- **retain sufficient remnants of heathland vegetation which would enable their recovery or**
- **are contiguous with, or form an integral part of an open area of heathland.**

c. Sites which support a significant population of a species as discussed in the species guidance.

Justification

Lowland heath is a priority for conservation because it is an internationally rare and threatened habitat that has suffered dramatic decline in the past century. Lowland Heathland is identified as a priority habitat within the UK Biodiversity Action Plan and has been included within the Surrey Biodiversity Action Plan. Surrey's heathland is of international importance and we therefore have an international responsibility to conserve it. One of the actions within the Surrey HAP for heathland is to "*ensure safeguard of all non-SSSI heathland sites by non-statutory (SNCI) recognition*".

Application

A definition of heathland is given within Surrey's Biodiversity Action Plan as "*an open landscape, generally occurring on poor, acidic sandy soils below 300 metres in altitude. It is characterised by the presence of dwarf shrubs of the heather family, notably ling (Calluna vulgaris), bell heather (Erica cinerea), cross-leaved heath (Erica tetralix) and bilberry (Vaccinium myrtillus). However, it is generally viewed with a wider perspective including areas of gorse, bracken, acidic grassland, valley bogs, bare sandy or peaty ground, scattered trees and shrubs and open water habitats.*" The boundaries of heathland SNCIs should be drawn to include any contiguous areas of acid grassland or common gorse (*Ulex europaeus)* on acidic substrates and any areas of scrub, conifer plantations, secondary birch, woodland or other vegetation which could potentially be restored to heathland or which might contribute to the biodiversity interest of the heathland habitat.

8 Standing open water

Sites which meet the following criteria should be considered for selection;

Criteria

a. Any lake classified by the UK Lakes HAP joint steering group as Tier 1 or Tier 2 where not already covered by other designations.

b. Ponds which qualify under the criteria for UK BAP priority habitat.*

c. Water bodies or clusters of water bodies which support a significant population of a species as discussed in the species guidance.

Justification

Eutrophic standing waters and mesotrophic lakes are recognised as priority habitats within the UK Biodiversity Action Plan. Oligotrophic and dystrophic lakes and ponds have recently been recommended as new UK priority habitats. Standing open water has been identified as a priority within Surrey's Biodiversity Action Plan. In Surrey a number of large water bodies are important for wintering waterfowl and some are given international protection. Those not given international or national protection may be important in forming part of a complex of lakes in support of the protected sites. One of the actions within the Surrey HAP for open water and large reedbeds is to "*seek to safeguard all important non SSSI open waters by non-statutory (SNCI) recognition"*. The UK Lakes HAP joint steering group have classified lakes into tiers based on their biodiversity value and potential for restoration. Tier 1 sites are sites of known conservation importance which are known to be close to their natural state. Tier 2 lakes are sites of known conservation importance which have become degraded but are considered to have the capacity to respond well to restoration measures.

Application

Standing open water includes freshwater ponds, lakes, lagoons, reservoirs, ditches, drains and canals. Some will be natural features although many will have been created by man. An appropriate buffer zone should be included within the SNCI in order to protect the interest of the site from pollution or disturbance. This should be a minimum of 5m, but in many cases will need to be larger.

Lakes classified as Tier 1 or Tier 2 by the UK Lakes HAP joint steering group can be found on their website; www.lakeshap.org.uk

* UK BAP priority habitat Ponds are defined as permanent and seasonal standing water bodies up to 2ha in extent which meet one or more of the following criteria:

• *Habitats of international importance.* Ponds that meet criteria under Annex I of the Habitats Directive.

• *Species of high conservation importance*. Ponds supporting Red Data Book species, UK BAP species, species fully protected under the Wildlife and Countryside Act

Schedule 5 and 8, Habitats Directive Annex II species, a Nationally Scarce wetland plant species, or three Nationally Scarce aquatic invertebrate species.

• *Exceptional assemblages of key biotic groups*: Ponds supporting exceptional populations or numbers of key species. Based on (i) criteria specified in guidelines for the selection of biological SSSIs (currently amphibians and dragonflies only), and (ii) exceptionally rich sites for plants or invertebrates (i.e. supporting ≥30 wetland plant species or ≥50 aquatic macroinvertebrate species).

• *Ponds of high ecological quality:* Ponds classified in the top PSYM category ("high") for ecological quality (i.e. having a PSYM score ≥75%). [PSYM (the Predictive SYstem for Multimetrics) is a method for assessing the biological quality of still waters in England and Wales; plant species and / or invertebrate families are surveyed using a standard method; the PSYM model makes predictions for the site based on environmental data and using a minimally impaired pond dataset; comparison of the prediction and observed data gives a % score for ponds quality]

• *Other important ponds:* Individual ponds or groups of ponds with a limited geographic distribution recognised as important because of their age, rarity of type or landscape context. In Surrey this may include ephemeral ponds or dew ponds.

9 Wetlands

Sites which meet the following criteria should be considered for selection;

Criteria

a. All reedbeds over 2ha.

b. Reedbeds of between 0.25 and 2ha where they form part of a wider habitat mosaic.

c. Fens, mires, swamps and marshes over 2ha with flora characteristic of the following NVC communities: M6, M21, M24, M25, M27, M29, S3, S4, S5, S6, S7, S8, S9, S10, S12, S13, S14, S15, S16, S19, S22, S23, S26, S27, S28.

d. Fens, mires, swamps and marshes (NVC as above) of between 0.25 and 2ha where they form part of a wider habitat mosaic.

e. Sites which support a significant population of a species as discussed in the species guidance.

Justification

The UK is thought to contain a large proportion of the surviving wetland resource within the EU (Surrey Wetland HAP). Lowland fens and reedbeds are recognised as priority habitats within the UK Biodiversity Action Plan and fen, marsh and swamp is listed as a broad habitat. Large reedbeds and wetland (incorporating rivers and streams, fen, marsh, swamp and linear reedbed), have been identified as priorities within Surrey for which habitat action plans have been written. The Surrey HAP for Open Water and Large Reedbeds states that in Surrey, stands of reedbed of 2 hectares or more are significant. As in other counties, wetland losses other than open water in Surrey have been high and the remaining sites in Surrey, although often small and fragmented are important to protect (Surrey Wetland HAP). Actions within the Surrey HAP for Wetlands include to "*ensure that wildlife sites of county importance are protected through the planning system"* and to *"continue the identification and review of county wildlife sites through the SNCI project"*. The NVC communities listed are taken from the Surrey BAP.

Application

Wetlands, for the purpose of this guidance include reedbeds (except linear), fens, mires, swamps and marshes. The UK BAP defines reedbeds as wetlands dominated by stands of the common reed (*Phragmites australis)*, wherein the water table is at or above ground level for most of the year. Fens, mires and swamps refer to a range of waterlogged land with varying water sources and pH (see the Surrey Wetland HAP for more detailed definitions). The boundary of wetland sites should include subsidiary habitats if they either warrant designation in their own right or if they are hydrologically contiguous with the wetland or provide important habitat for part of the life cycle of species of interest that are associated with the SNCI. An appropriate buffer zone should be included within the SNCI in order to protect the interest of the

site from pollution or disturbance. This should be a minimum of 5m, but in many cases will need to be larger.

10 Floodplain Grazing Marsh

Sites which meet the following criteria should be considered for selection;

Criteria

a. All floodplain grazing marsh (as defined below) over 5ha that is not designated as SSSI.

b. Floodplain grazing marsh (as defined below) of less than 5ha where it forms part of a wider habitat mosaic of water-dependent habitats, or where it links SSSIs.

c. Sites which support a significant population of a species as discussed in the species guidance.

Justification

Floodplain grazing marsh is recognised as a priority habitat within the UK Biodiversity Action Plan (BAP) and has been identified as a priority within Surrey for which a habitat action plan has been written. The Surrey HAP for floodplain grazing marsh includes an action to *"ensure safeguard of all non-SSSI floodplain grazing marsh sites by non-statutory designation (SNCI).* Grazing marshes are particularly important for the number of breeding waders they support, such as snipe, lapwing and curlew.

Application

Grazing marsh is defined as periodically inundated pasture, or meadow with ditches which maintain the water levels. Help with the identification of this habitat can be gained by looking at Environment Agency floodplain maps as well as soil maps - floodplain grazing marsh will be found on mineral rather than organic soils. Grazing should be feasible on the site, but not necessarily in place at the time. The ditches tend to be rich in plants and invertebrates, while the grassland itself is often agriculturally improved and therefore has low species diversity. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds.

The boundary of wetland sites should include subsidiary habitats if they either warrant designation in their own right or if they are hydrologically contiguous with the wetland or provide important habitat for part of the life cycle of species of interest that are associated with the SNCI. An appropriate buffer zone should be included within the SNCI in order to protect the interest of the site from pollution or disturbance. This should be a minimum of 5m, but in many cases will need to be larger.

11 Rivers, Canals and Streams

Sites which meet the following criteria should be considered for selection;

Criteria

a. All chalk streams should be selected.

b. All stretches of river classed by the Environment Agency as Grade A within the General Quality Assessment (GQA) should be selected.

c. All stretches of river with a Habitat Modification Score (HMS) of 0 (classified as "pristine" by River Habitat Surveys (RHS)) should be selected.

d. All stretches of river with a conservation evaluation of either "Critical" or "Important" within strategic River Corridor Surveys (RCS) should be selected.

e. All stretches of river which support viable populations of Water Vole, Otter, White Clawed Crayfish, Depressed River Mussel, Two-tone Reed Beetle, Brown Trout, Eel, Cut-grass or any Red Data Book species should be selected. Spawning sites for River Lamprey, Atlantic Salmon, Sea Trout or Barbel should be selected.

f. Sites which support a significant population of a species as discussed in the species guidance.

Justification

Chalk rivers are recognised as a priority habitat within the UK Biodiversity Action Plan which has recently been expanded to include additional rivers and streams. Work is currently ongoing to develop guidelines for the identification of river reaches which will be priorities for UK BAP action. Rivers and streams are included within the wetland HAP for Surrey. As well as the plants and animals that streams and rivers support they also function as valuable wildlife corridors between fragmented habitats in intensively farmed or urban settings.

The GQA (biological) score is a standardised method that the Environment Agency uses to assess the biological quality of a river. It grades rivers from A – F. River stretches that are classified as 'A – very good' have a biology similar to (or better than) that expected for a totally unpolluted river.

The RHS is a standardised method for assessing the character and quality of rivers based on their physical structure. A HMS is produced which describes the level of artificial modification to the river stretch. The ecological value of many rivers in Surrey today has been greatly reduced by flood defence structures and impoundments; therefore rivers that have not been significantly modified represent a very valuable ecological resource.

The RCS is a standardised method used to classify the ecological value of river corridors.

All of the species within the 5th criteria except for the Barbel are Priority UK BAP species . Although the Barbel is not a Priority UK BAP species, it indicates high quality river habitat.

Application

GQA, RCS and RHS data can be obtained from the Environment Agency. Sites should be assessed on the most up to date data at the time of selection.

Where rivers are borderline cases using the guidance above, additional information can be used as part of the selection process. For example river stretches classed as Grade B within the GQA could be considered for selection if there is other evidence of their value. Other data that could be used for selection which is available from the Environment Agency is Mean Trophic Ranking which assesses the level of eutrophication in a river.

Determining the boundary of a river SNCI

- The length of the riverine SNCI should be consistent with the length of the qualifying feature (or the longest feature if there are multiple qualifying features). For example GQAs are based on the Environment Agency's recognised 'waterbodies' as defined by the Water Framework Directive. Therefore an SNCI selected for its GQA score should include the entire stretch of river within that 'waterbody'.

- Stretches of river selected for a specific species should include a buffer of 1km both upstream and downstream of the viable population of the species.

- The lateral boundary of the SNCI should be defined using the following guidelines which are used for the selection of river SSSIs (Nature Conservancy Council 1989);
  "*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 river bank, this should be included within the boundary if possible."*

- The final stage in the process of determining the boundary for a river SNCI should be a rationalisation process. This should ensure that selected stretches of river are not isolated. If two sections of selected river are separated by a gap of less than 3km, the gap should also be selected.

12 Open Mosaic Habitats on Previously Developed Land

Sites which meet the following criteria should be considered for selection;

Criteria

a. **Open Mosaic habitat sites where;**
   - **6 or more of the characteristic features listed below are found in combination**
   - **Sites form part of a wider complex of similar areas, providing long term habitat opportunity**
   - **There is a significant invertebrate assemblage**

b. **Sites which support a significant population of a species as discussed in the species guidelines.**

Justification

In recent years it has been increasingly recognised that Brownfield sites provide important habitat, particularly for rare and local invertebrates. "Open Mosaic Habitats on Previously Developed Land" is a new UK BAP Priority Habitat which has particular relevance to Surrey. The habitat is clearly at substantial risk and subject to destruction and serious degradation. Major factors threatening it include urban development, landfill, unsuitable reclamation, eutrophication, lack of appropriate management and natural succession. The habitat clearly supports many species and some habitat types that are a priority for nature conservation.

This habitat is exceptionally important for invertebrate communities, especially rare species of Hymenoptera and Coleoptera. It is of particular importance for species requiring bare substrate, sandy burrowing or nesting sites, and nectar sources. Certain UK BAP priority plant species are strongly associated with this habitat. The habitat includes several scare and threatened open vegetation communities. Sites may contain significant areas of other target habitats, especially areas of grassland, heathland and scrub.

Selected sites may be particularly important as they provide areas of early/pioneer habitat and general refugia within otherwise impoverished landscape areas.

Application

The term covers a wide range of different sites and landuses. In Surrey mineral sites and previously built land are key examples. Brownfield sites share a number of characteristic features which lead to invertebrate diversity, in particular structural and floristic diversity combined with bare ground, creating a mosaic. Natural England has defined the following features as being particularly associated with early successional habitats. The key features of this mosaic are:

- **Floristic and habitat diversity**
  High species richness and small-scale habitat heterogeneity

- **Soil type and structure**
  Soil with low fertility or other characteristics affecting plant growth
- **Topography**
  Variation in ground level with slopes and vertical faces
- **Succession**
  Gradation from bare ground through to more mature vegetation
- **Bare ground**
  Areas with no vegetation, especially undisturbed
- **Shelter**
  Development of trees and scrub providing structural diversity
- **Disturbance**
  Any disturbance serving to maintain bare ground and habitat mosaic
- **Surrounding landuse**
  Adjacent areas providing potential (eg active workings) or connectivity

13 Arable

Sites which meet the following criteria should be considered for selection;

Criteria

a. All sites which meet the criteria for Important Arable Plant Areas which are not covered by other designations.

b. Sites which support a significant population of a species as discussed in the species guidance.

Justification
Arable plants have seen massive declines during the second half of the 20th century. Cereal field margins is a priority habitat within the UK BAP. Farmland is included within the Surrey Biodiversity Action Plan.

Application
The criteria for the selection of Important Arable Plant Areas as produced by Plantlife (Byfield & Wilson 2005) is attached in appendix 2.

14 Scrub Communities

Recommendation

When selecting sites based on other habitats all areas of associated scrub should be identified and included within the SNCI boundary. The site notes should highlight the importance of scrub and any management recommendations should safeguard this habitat.

Justification
The 2005-7 UK BAP Priority Habitats Review emphasised the importance of Scrub habitats and recommended that Scrub should be recognised as a key component of various priority habitats.

Various types of scrub provide 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. There are several Annex I types which are based on scrubby formations, including heath types, juniper scrub, and scrubland facies on calcareous grasslands.

Application
Scrub can be defined as all stages from scattered bushes to closed canopy vegetation, dominated by locally native or non-native shrubs and tree saplings, usually less than 5m tall, occasionally with a few scattered trees. This includes carr, lowland scrub (including wood edge habitats) and hedgerows. The definition excludes dwarf shrub heaths, planted stands of young trees and coppice stump regrowth less than 5m high (English Nature, 2000).

15 Community and access

Criteria

- **sites which are close to but do not fully meet the habitat or species guidelines listed elsewhere may be considered for selection if they serve as Accessible Natural Greenspace within urban areas, as defined below.**

Justification
The Defra guidance (Defra, 2006) emphasises the need to include the importance of Greenspace for local communities particularly in urban areas in the criteria used for local site selection. The guidance states;

> *"In populous areas that are poorer in high quality natural environment, sites of lesser intrinsic ecological or geological interest may still be of substantive nature conservation value for the opportunities they provide for the appreciation of nature*."

Application
Definition of accessible natural Greenspace
The importance of Greenspace has been investigated by Natural England (English Nature 1995) which has recommended that at least 2ha of accessible natural Greenspace per 1000 population should be provided. Sites should be available according to the following system;

- no person should live more than 300m from their nearest area of natural greenspace;
- there should be at least one accessible 20ha site within 2km from home;
- there should be one accessible 100ha site within 5km;

- there should be one accessible 500ha site within 10km.

The above review lists a wide range of sites which may be considered as natural Greenspace which are already included within the various SNCI habitat selection guidance;

- land alongside water-ways, transport and service corridors which although perhaps once deliberately landscaped or planted are now mixtures of planted and spontaneous assemblages;
- tracts of 'encapsulated countryside' such as woodlands, scrub, heathlands, meadows, and marshes which through appropriate management continue to support essentially wild plant and animal assemblages. Often these natural areas exist within the framework of formally designated public open space;
- ponds, ditches, rivers, lakes and reservoirs;
- the less intensively managed parts of parks, school grounds, sports pitches, golf courses , churchyards and cemeteries;
- incidental pocket-sized plots along residential and commercial roads, pathways, car-parks and property boundaries, including walls and built structures which are often spontaneously colonised by plants and animals;
- allotments, orchards and gardens

Definition of urban area

For the purposes of SNCI selection, the definition of an urban area will follow the recommendations contained in *"Review of Urban and Rural Definitions"* (ODPM 2004), which formed the basis for the 2001 Urban Settlements dataset produced jointly by OPDM, Office for National Statistics and Ordnance Survey. This defines Urban Settlements as areas with a *land use* that is irreversibly urban in character [1], the boundaries of which are independent of administrative area boundaries.

The definition appears as computer readable boundaries of all built up settlements with a minimum population (as recorded in the 2001 Census) in excess of 1,500 covering a minimum land area of 20 hectares [2].

When defining urban and rural areas ODPM proposed a cut off in terms of population, of 10,000. Using this standard, all settlements of over 10,000 are treated as urban area. All smaller settlements, together with all other land, are treated as rural areas. As such, the selection criteria described above would normally only be used for sites falling within such qualifying areas (where the boundaries of that settlement are those defined by OPDM above).

[1] From 1991 urban land was identified under the following categories: a) permanent structures and the land on which they are situated (a 'built up' site); b) transportation corridors (e.g. roads, railways and canals), which have built up sites on one or both sides, or which link up built up sites which are less than 50 metres apart; c) transportation features such as airports and operational airfields, railway yards, motorway service areas and car parks; d) mine buildings (but mineral workings and quarries are excluded); e) any area completely surrounded by built-up sites, and f) playing fields and golf courses that are surrounded by a built up area (otherwise they are excluded).

[2] Separate areas of urban land are aggregated if they are less than 200 metres apart.

16 Geology and Geomorphology

Recommendation

Geological/Geomorphological Sites (RIGS) will be regarded as the geological equivalent of SNCIs.

Section 3 Species Guidelines

General Species Guidelines

In general when selecting a site for the presence of a particular species, evidence should be based on records of not more than 5 years old. However it should be borne in mind that the monitoring of sites for the presence of species can take place only as often as resources allow.

A list of Species of Conservation Importance in Surrey is in the process of being compiled based on set criteria. The list is likely to include a scoring system with the species meeting more of the criteria achieving a higher score. Once this list has been complied consideration will be given as to how it can be used to guide the selection of SNCIs based on the species present. Following this, the species selection guidance for individual species groups may be amended. In the mean time, the following guidance should be used.

17 Mammals

Sites which meet the following criteria should be considered for selection;

Criteria

- **All sites known to support a viable population of the following species: -**

a. Dormouse, *Muscardinus avellanarius*

Justification

The dormouse has declined by over 50% since the early 1900's. It is a priority species under the UK Biodiversity Action Plan, and is protected under Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations 1994 and Schedule 5 of the Wildlife And Countryside Act 1981. Dormice are considered a flagship species, their presence is an indicator of habitat integrity and their habitat is usually very suitable for a wide range of other species. Dormice are present in very low numbers in Surrey and their population in the county is considered vulnerable.

b. Water Vole, *Arvicola terrestris*

Justification

The water vole has suffered a significant decline, nationally. A national survey in 1989-90 failed to find signs of voles in 67% of sites where they were previously recorded and this decline has continued since this time. The water vole is a priority species under the UK Biodiversity Action Plan and is protected under Schedule 5 (sec 9(4)) of the Wildlife and Countryside Act 1981. The Water Vole is present in very low numbers in Surrey and continues to decline.

c. Otter, *Lutra lutra*

Justification

The otter underwent a rapid decline in numbers from the 1950s to 1970s and was lost from Surrey at that time. The otter is a priority UK BAP species and is protected under Schedule 5 of the WCA 1981 and Schedule 2 of the Conservation (Natural Habitats, etc.) Regulations, 1994. In the last couple of years evidence of Otters moving back into Surrey has been found. A Surrey Species Action Plan is being produced for the species. The otter is considered a flagship species as their presence is likely to indicate a healthy aquatic environment.

Application of Mammal Guidance

Sites should be selected based on field signs or sightings of no more than 5 years old as well as an assessment of habitat suitability. The boundaries of the sites for the above species should include areas critical for nesting, foraging, laying up, territorial or other significant use, where this has been determined by survey. Where rivers/streams are selected, the boundary should be determined as described in the "Rivers, Canals and Streams" guidance and should include a buffer of 1km both upstream and downstream of the viable population of the species.

18 Mammals - Bats

Sites which meet the following criteria should be considered for selection;

Criteria

a. Sites containing a 'significant' bat breeding roost or hibernation site.

Application

This should be determined by experts using table 2 below as a guide. This table gives an indication of the numbers of bats which could be expected within a bat roost likely to be of significance within Surrey.

b. Any breeding roost or hibernation site used by multiple bat species concurrently should be considered for selection.

c. Foraging sites not associated directly with roosts should be considered for selection if more than 5 species are regularly recorded there or if used by any Annex II species.

Table 2 - A guide to the numbers of bats that may indicate a significant breeding roost or hibernation site in Surrey

Species	Maternity Roost	Hibernation Site
Barbastelle *(Barbastella barbastellus)**	1	1
Serotine *(Eptesicus serotinus)*	5	1
Bechstein's bat *(Myotis bechsteinii)**	1	1
Brandt's bat *(Myotis brandtii)*	5	2
Daubenton's bat *(Myotis daubentonii)*	40	5
Greater mouse-eared (*Myotis myotis)** +	1	1
Whiskered bat *(Myotis mystacinus)*	5	2
Natterer's bat *(Myotis nattereri)*	10	5
Leisler's bat *(Nyctalus leisleri)*	1	1
Noctule *(Nyctalus noctula)*	5	1
Common pipistrelle *(Pipistrellus pipistrellus)*	60	10
Soprano pipistrelle *(Pipistrellus pygmaeus)*	200	10
Nathusius' pipistrelle *(Pipistrellus nathusii)*	1	1
Brown long-eared bat *(Plecotus auritus)*	20	2
Grey long-eared bat *(Plecotus austriacus)*	1	1
Greater horseshoe bat *(Rhinolophus ferrumequinum)**	1	1
Lesser horseshoe bat *(Rhinolophus hipposideros)**	1	1

* Species listed in EU Habitats Directive Annex II.

+ Species thought to be extinct in the UK.

Justification

Bat populations across Europe are known to have declined dramatically in the last 150 years. Part of the reason for this is their vulnerability at certain times of the year. In the early summer large concentrations of female bats gather to give birth and if this maternity roost is disturbed or destroyed the breeding potential for an entire area will be lost. Bats also need sites with cool, constant temperatures and high humidity to enable them to hibernate efficiently, but suitable sites are becoming more difficult to find and while in hibernation bats are very vulnerable to disturbance.

All British bat species are afforded protection under the Wildlife and Countryside Act 1981 through inclusion on Schedule 5, and additionally under the Conservation (Natural Habitats & c.) Regulations 1994 through inclusion on annex IV. These make it illegal to kill, injure, capture or disturb bats; or to obstruct access to, damage or destroy a bat roost.

Although bats and their roosts are well protected by law their foraging areas, and commuting routes between the two, are not. However viable populations cannot be sustained without preserving important feeding areas and so these should also be considered for SNCI designation.

General Application of bat guidance

The bat selection criteria will not be applied to domestic buildings or to industrial and agricultural buildings in current use. Disused industrial and agricultural buildings, and other built structures such as ice houses, grottos, other architectural follies, mine shafts, military fortifications, bridges and tunnels, should be considered for selection. In addition to the resting sites, consideration should also be given to selecting surrounding semi-natural habitat used for foraging, commuting routes between sites and any important foraging sites identified away from the roosting site.

19 Amphibians

Sites which meet the following criteria should be considered for selection;

Criteria

a. Sites that support populations of Natterjack Toad, *Epidalea calamita*.

Justification

The Natterjack Toad is amongst the rarest animals in Britain. It requires specialised habitat which small parts of Surrey provide. All established populations of this species should already be covered by SSSI designation. The inclusion of this criteria will ensure that no sites are left unprotected.

b. Sites that regularly record 'good' or 'exceptional' breeding populations of Great Crested Newt, *Triturus cristatus*.

Justification

The Great Crested Newt has suffered a massive decline in numbers over recent years. Britain holds probably the largest population in the world and Surrey has a significant share of that population.

c. Sites which support populations of four or more native amphibian species.

Justification

This is considered to be a significant assemblage of amphibians for Surrey.

d. Sites that have recorded 'exceptional' populations of any amphibian species.

Justification

Sites containing 'exceptional' populations are important for the population of the species within Surrey and should be protected.

e. Sites that have recorded 'good' populations of 3 or more native amphibian species.

Justification

Such sites are considered significant and important to protect within Surrey.

General Application of amphibian guidance

'Good' and 'exceptional' populations can be determined using the scoring system below. This has been taken from the *Guidelines for selection of biological SSSIs* (1989, Nature Conservancy Council) which has been amended by the Surrey Amphibian and Reptile Group to reflect the status of amphibians within Surrey.

Data should be based on at least 2 years of data which should have been gathered within the last 10 years by experienced personnel. The highest count on a given year of monitoring can be taken as the population class size. This guidance should be used to guide decisions and the final decision on the selection of sites should be agreed by relevant experts such as Surrey Amphibian and Reptile Group.

The boundary of the SNCI should include the pond as well as adjacent habitat known or likely to be used by the amphibian species for which the site is designated. The boundary should be determined by experienced personnel with a detailed knowledge of the site in question.

Domestic gardens can be included in the selection where owners agree to inclusion as an SNCI or it contains a pond of an origin that pre-exists its current usage as a garden pond.

Ponds in a cluster can support a metapopulation. Such ponds can be included as one site, and therefore the counts for each of the ponds combined, if they are not separated by any obvious barriers and preferably are connected by suitable amphibian terrestrial habitat. Water bodies within 250m can be considered as a cluster. Where there are isolated ponds within 500m of each other they could be considered together if connected by amphibian terrestrial habitat known to be used or likely to be used by amphibians.

The occurrence of any amphibian species on a site should be considered as a supporting reason for selection of a site which also qualifies under other guidelines.

Where notable populations of amphibians are present, sites currently designated SSSI can have additional designation of SNCI to ensure that all reasons for protection are cited.

Table 3 - A scoring system for the selection of amphibian sites in Surrey

		Low Population	**Good Population**	**Exceptional population**
		Score 1	Score 2	Score 3
Great Crested Newt, *Triturus cristatus*	Seen or netted in day	<5	5-30	>30
	Counted at night	<10	10-50	>50
Smooth Newt, *Lissotriton vulgaris*	Netted in day	<10	10-100	>100
	Counted at night			
Palmate Newt, *Lissotriton helveticus*	Netted in day	<10	10-100	>100
	Counted at night			
Common Toad, *Bufo bufo*	Estimated	<300	300-2,000	>2,000
	Counted	<100	100-800	>800
Common Frog, *Rana temporaria*	Spawn clumps counted	<50	50-500	>500

- Counts should be for breeding sites observed during the breeding season.
- Daytime netting should be made during a 15-minute period for sites with less than 50m of water's edge, for 30 minutes for sites with 50-100m, etc.
- Data from toad crossings on roads can be used to identify population numbers within the breeding pond.

20 Reptiles

Sites which meet the following criteria should be considered for selection;

Criteria

a. Sites that support populations of smooth snake, *Coronella austriaca* or sand lizard, *Lacerta agilis*.

Justification

The smooth snake and sand lizard are amongst the rarest animals in Britain. They require specialised habitat which small parts of Surrey provide.

b. Sites which contain populations of 3 or more native reptile species (adder, *Vipera berus*, grass snake, *Natrix natrix*, viviparous lizard, *Zootaca vivipara* and slow-worm, *Anguis fragilis*).

Justification

The SSSI guidelines recommend that the best localities containing "at least three" of the commoner native reptiles be selected as potential SSSIs. The SNCI network should be used to extend the protection to all sites of conservation value for reptiles that fall outside the SSSI guidelines.

c. Sites with an 'exceptional' population of a single reptile species or a 'good' population of adders.

Justification

Sites containing 'exceptional' populations are important for the population of the species within Surrey and should be protected.

d. Sites supporting an assemblage of species scoring at least 4 points using the scoring system below can be considered for selection.

Justification

This is considered to be a significant assemblage of reptiles for Surrey.

General application for reptile guidance

The determination of an exceptional population should be based on the scoring system below. This scoring system is used by Froglife for identifying Key Reptile Sites. It should be based on the maximum number of adult animals seen under artificial refugia (placed at a density of up to 10 per hectare) or by general observation by one experienced person in one day.

Data should be based on at least 2 years of data which should have been gathered within the last 10 years by experienced personnel. The highest count on a given year of monitoring can be taken as the population class size. This criteria should be used to guide decisions and the final decision on the selection of sites should be agreed by relevant experts.

Domestic gardens can be included in the selection where owners agree to inclusion as an SNCI.

When deciding the boundary of the SNCI, contiguous, open, semi-natural habitat should be included. Suitable man-made structures (e.g. tumuli, embankments and stone walls) should also be included. Site boundaries should take into account the area of habitat used by the species throughout the year, particularly hibernation and breeding sites and favoured feeding habitat. This should be determined by experienced personnel with a detailed knowledge of the site in question.

The occurrence of any reptile species on a site should be considered a supporting reason for selection of a site which also qualifies under other guidelines.

Table 4 - A scoring system for the selection of reptile sites in Surrey

	Low Population Score 1	**Good Population Score 2**	**Exceptional Population Score 3**
Adder ***Vipera berus***	<5	5-10	>10
Grass snake ***Natrix natrix***	<5	5-10	>10
Viviparous lizard ***Zootaca vivipara***	<5	5-20	>20
Slow worm ***Anguis fragilis***	<5	5-20	>20

21 Birds

Bird data can be complex and require expert interpretation therefore sites should be considered on a case by case basis following advice from local experts such as Surrey Bird Club.

Sites which meet the following criteria should be considered for selection;

Criteria

a. Any site that holds more than 10% of Surrey's breeding or wintering population of a species.

Justification

Such sites are important for the maintenance of the total county population.

Application

Evidence should be based on the last 5 years of published bird data (i.e. the last 5 Surrey Bird reports published) and sites should be judged on the average population over 5 years if known. If more up to date information is provided by Surrey Bird Club, this can also be used.

b. Any site that supports species on the conservation concern list for Surrey categories 1-3 (devised by Surrey Bird Club, see table 5 – the species must be either breeding or wintering as specified in the table).

Justification

The list of species of conservation concern within Surrey has been devised by Surrey Bird Club using the criteria shown in Appendix A.

Application

Information on breeding and wintering species will be obtained from local experts including Surrey Bird Club. The list of species of conservation concern within Surrey states for each species whether a wintering or breeding population is required for each species. One-off sightings of birds cannot be used as evidence for this criteria. Regular sightings over at least two years within the breeding or wintering seasons (mid April-mid July for breeding and December-mid February for wintering) would constitute sufficient evidence.

c. Any site which supports a breeding bird assemblage or wintering waterbird assemblage of county importance as indicated by the table 6.

Justification

This guideline is intended to identify important assemblages of different bird species, characteristic of particular habitats, which are significant in a County context. The tables in Appendix B, which have been adapted, by Surrey Bird Club, from the guidelines regarding the selection of SSSIs, identify sites that are likely to be of county importance within Surrey. The farmland bird species were selected based on those selected for the national farmland bird index, one of the Government's Indicators of Sustainable Development.

Application

Information on breeding and wintering species will be obtained from local experts including Surrey Bird Club. One-off sightings of birds cannot be used as evidence for this criteria. Regular sightings over at least two years within the breeding or wintering seasons (mid April-mid July for breeding and December-mid February for wintering) would constitute sufficient evidence.

General application of bird guidance

The boundary of the SNCI should include land used for activities associated with breeding, foraging and roosting. Local experts should advise on suitable boundaries on a case by case basis.

The value of a site within a complex should be considered as birds will often move between sites within a discreet geographical area depending on food availability, levels of human disturbance, predation and roosting opportunities.

Eligible sites will exclude domestic, agricultural and industrial buildings which are in use.

Table 5 – Bird species of Conservation Concern within Surrey
(B = a breeding population, W = a wintering population)
(B) = not currently breeding in the county but expected to in the near future)

Species	**Category**			**Notes**
	1	**2**	**3**	
Bittern, *Botaurus stellaris*	W	W		Nationally rare breeder, small numbers winter in Surrey. Schedule 1 species.
Honey Buzzard, *Pernis apivorus*	B	B		Schedule 1 species
Goshawk, *Accipter gentilis*	B	B		Schedule 1 species
Firecrest, *Regulus ignicapillus*	B	B		Schedule 1 species
Garganey, *Anas querquedula*	(B)	(B)		Has bred, may do so in future. Schedule 1 species
Pochard, *Aythya ferina*	B	B		
Little Ringed Plover, *Charadrius dubius*	B	B		Schedule 1 species
Hobby, *Falco subbuteo*	B		?	Schedule 1 species
Peregrine, *Falco peregrinus*	B	B		Schedule 1 species
Gadwall, *Anas strepera*	B	B		
Woodlark, *Lullula arborea*	B		B	Relatively common in Surrey, rare UK breeding species. Surrey holds large % of UK population. Schedule 1 species
Black Redstart, *Phoenicurus ochruros*	B	B		Schedule 1 species
Dartford Warbler, *Sylvia undata*	B		B	Relatively common in Surrey, rare UK breeding species. Surrey holds large % of UK population. Schedule 1 species
Water Rail, *Rallus aquaticus*	B	B		
Common Redpoll, *Carduelis flammea*	B	B		
Hawfinch, *Coccothraustes coccothraustes*	B	B / W		Likely to be still breeding in Surrey.
Shoveler, *Anas clypeata*	(B)	(B)		Has bred, might to do in the future.
Little Egret, *Egretta garzetta*	(B)	(B)		Potential breeding species in near future – breeds in adjacent in-land county (Berkshire)
Cetti's Warbler, *Cettia cetti*	(B)	(B)		Potential breeding species in near future – number of records in county increasing
Barn Owl, *Tyto alba*		B		Schedule 1 species
Shelduck, *Tadorna tadorna*		B		
Teal, *Anas crecca*		B		

Species	Category			Notes
	1	2	3	
Smew, *Mergus albellus*		W		
Grey Partridge, *Perdix perdix*		B / W		Might still breed in Surrey in areas unknown.
Ringed Plover, *Charadrius hiaticula*		B		Regularly breeds in Spelthorpe, occasionally within 'old' county boundary.
Dunlin, *Calidris alpina*		W		
Jack Snipe, *Lymnocryptes minimus*		W		
Snipe, *Galinago gallinago*		(B)		
Curlew, *Numenius arquata*		B		
Redshank, *Tringa totanus*		B		
Long-eared Owl, *Asio otus*		W / B ?		
Yellow Wagtail, *Motacilla flava*		(B)		Has bred, may do so with suitable habitat creation.
Grasshopper Warbler, *Locustella naevia*		(B)		Has bred, may do so with suitable habitat creation.
Wood Warbler, *Phylloscopus sibilatrix*		B		
Marsh Tit, *Parus palustris*		B		
Willow Tit, *Parus montanus*		(B)		
Tree Sparrow, *Passer montanus*		B		
Siskin, *Carduelis spinus*		B		
Common Crossbill, *Loxia curvirostra*		B		
Corn Bunting, *Miliaria calandra*		(B) / W		Might breed in Surrey in areas unknown.
Nightjar, *Caprimulgus europaeus*			B	
Nightingale, *Luscinia megarhynchos*			B	Large population decline in UK & possibly Surrey.

Category 1: UK rare breeding species (either scarce or scarce breeders) as identified by the UK Rare Breeding Birds Panel. Often Schedule 1 species.

Category 2: A species with 20 or fewer breeding pairs in Surrey, which is restricted to 10 or less breeding sites, with 20 or less wintering individuals in Surrey or that is restricted to 10 or less wintering sites.

Category 3: A species for which Surrey holds a significant percentage (> 1.5%) of the UK breeding population.

Table 6 – Bird assemblages likely to be of county importance in Surrey

Lowland damp grassland

Mute swan	2.5	Curlew	3
Shelduck	4	Redshank	3
Gadwall	5	Cuckoo	2
Teal	4	Yellow wagtail	3
Garganey	5	Whinchat	3
Shoveler	4	Grasshopper warbler	3
Lapwing	2	Sedge warbler	1.5
Snipe	3	Reed bunting	1

A score of **9** or more points is indicative of high quality habitat.

Lowland fen without open water

Little grebe	3	Cuckoo	2
Gadwall	5	Whinchat	3
Teal	4	Cetti's warbler	5
Garganey	5	Grasshopper warbler	3
Shoveler	4	Sedge warbler	1.5
Pochard	4	Reed warbler	2
Water rail	4	Reed bunting	1.5
Snipe	3		

A score of **11** or more points is indicative of high quality habitat.

Lowland open waters and their margins

Little grebe	3	Ringed plover	4
Great crested grebe	3	Snipe	3
Grey heron	2.5	Redshank	3
Mute swan	2.5	Common tern	3
Shelduck	4	Cuckoo	2
Gadwall	5	Kingfisher	3
Teal	4	Yellow wagtail	3
Garganey	5	Grey wagtail	2.5
Shoveler	4	Cetti's warbler	5
Pochard	4	Grasshopper warbler	3
Tufted duck	3	Sedge warbler	1.5
Water rail	4	Reed warbler	2
Little ringed plover	4	Reed bunting	1.5

A score of **15** or more points is indicative of high quality habitat.

Lowland heath

Hobby	4	Tree pipit	2
Snipe	3	Whinchat	3
Curlew	3	Stonechat	2
Redshank	3	Wheatear	3
Cuckoo	2	Grasshopper warbler	3
Long-eared owl	4	Dartford warbler	3
Nightjar	3	Linnet	1
Woodlark	3		

A score of **10** or more points is indicative of high quality habitat.

Scrub (excluding heath)

Turtle dove	2.5	Stonechat	2
Cuckoo	2	Grasshopper warbler	3
Long-eared owl	4	Whitethroat	1
Nightjar	3	Lesser whitethroat	2.5
Tree pipit	2	Garden warbler	1
Nightingale	3.5	Blackcap	1
Whinchat	3	Linnet	1

A score of **9** or more points is indicative of high quality habitat.

Farmland

Kestrel	2	Jackdaw	1
Grey partridge	3	Tree sparrow	3
Lapwing	2	Greenfinch	1
Stock dove	1	Goldfinch	1
Turtle dove	2.5	Linnet	1
Skylark	1	Yellowhammer	2
Yellow wagtail	3	Reed bunting	1.5
Whitethroat	1	Corn bunting	3.5

A score of **11** or more points is indicative of high quality habitat.

Woodland

Grey heron	2.5	Garden warbler	1
Honey buzzard	5	Blackcap	1
Red kite	5	Wood warbler	3
Goshawk	4	Chiffchaff	1
Sparrowhawk	2	Goldcrest	1
Buzzard	2	Firecrest	5
Hobby	4	Spotted flycatcher	2.5
Woodcock	2.5	Long-tailed tit	1
Stock dove	1	Marsh tit	3
Cuckoo	2	Willow tit	4
Tawny owl	2	Coal tit	1
Long-eared owl	4	Nuthatch	1
Nightjar	3	Treecreeper	1
Green woodpecker	2	Jay	1
Great spotted woodpecker	1	Siskin	2
Lesser spotted woodpecker	3	Redpoll	3
Tree pipit	2	Common crossbill	4
Nightingale	3.5	Bullfinch	1.5
Redstart	2	Hawfinch	4

A score of **25** or more points is indicative of high quality habitat.

Winter waterbird community

Little grebe	2	Goldeneye	3.5
Great crested grebe	2	Smew	4
Black-necked grebe	4	Gooseander	3.5
Cormorant	2	Coot	1
Mute swan	2	Snipe	2
Shelduck	3	Jack snipe	4
Wigeon	2	Redshank	3
Gadwall	2	Golden plover	2.5
Teal	2	Lapwing	2
Pintail	3	Dunlin	3
Shoveler	2.5	Common gull	1
Pochard	2	Herring gull	1
Tufted duck	2	Great black-backed gull	2
Lesser black-backed gull	1		

A score of **20** or more points is indicative of high quality habitat.

22 Invertebrates

Sites which meet the following criteria should be considered for selection;

Criteria

a. Sites supporting one or more nationally rare or declining species as listed in the latest national Red Data Books or lists.

Application

Reference should be made to British Red Data Books: 2 Insects (Shirt, 1987) or British Red Data Books: 3 Invertebrates other than insects (Bratton, 1991). However it should be noted that these books are now out of date for many species and many orders have been reviewed since this time. Consultation should take place with appropriate experts in order to determine whether a species remains important at the time of site selection.

b. Sites supporting an important assemblage or population(s) of a species included in the UK list of Biodiversity Action Plan (BAP) priority species.

Application

The most up to date list of UK BAP priority species should be used. At the time of writing the list was last updated in 2007. Whether the assemblage or population is 'important' should be determined in consultation with appropriate experts as some of these species may be widespread and abundant in parts of Surrey.

c. Sites supporting an important assemblage or population(s) of a nationally scarce species.

Application

The following are regarded as evidence for confirmed or probable breeding of an invertebrate species;

- Regular occurrence of the species at the site over successive years.
- Confirmed mating, ova, larvae or pupae at the site.
- Occurrence of several individuals of the particular species recorded at the site on a single visit.

Whether the assemblage or population is 'important' should be determined in consultation with appropriate experts as many species which are nationally scarce are widespread and abundant in parts of Surrey. 'Nationally scarce' invertebrates, referred to as 'Notable a' or 'Notable b' are listed in the Invertebrate Site Register and national species-group reviews. (Nationally scarce = species recorded in 16-100 10km squares in GB, Notable a: less than 30 10km squares, Notable b: 31-100 10km squares).

23 Additional Invertebrate Guidelines

Some invertebrate groups are sufficiently well known in Surrey to merit special treatment within these guidelines as outlined below. In the future it may be useful to expand this section to focus on other key groups for example the saproxylic quality

index and the wetland beetle assemblage (wet score) could be utilised in order to identify sites of SNCI quality.

Dragonflies

a. Sites which meet the British Dragonfly Society criteria for Key Dragonfly Sites

Application
The British Dragonfly Society has recently produced criteria for the selection of nationally and regionally important dragonfly sites. Using their criteria, a key site is determined if, over the last 10 years, there is the presence of an abundant or persistent breeding population of either a nationally or regionally important species, or a diversity of species. For Surrey the important species are:

Nationally Important
Scarce Blue-tailed Damselfly (*Ischnura pumilio)*
Variable Damselfly (*Coenagrion pulchellum)*
Small Red Damselfly (*Ceriagrion tenellum)*
Common Club-tail (*Gomphus vulgatissimus)*
Brilliant Emerald (*Somatochlora metallica)*
Scarce Chaser (*Libellula fulva)*

Regionally Important
Hairy Dragonfly (*Brachytron pretense)*
Golden-ringed Damselfly (*Cordulegaster boltonii)*
Keeled skimmer (*Orthetrum coerulescens)*

Diversity of species is taken as 14 or more abundant breeding species present at the site

Evidence of breeding is taken as recording of ovipositing, larvae, exuviae, emergence, or copulating pairs (observation of copulating pairs making the site a probable key site with need to record the more stricter breeding evidence to confirm the site as a key site).

Evidence of an abundant population is generally the observation (for any stage) of 21 or more individuals for damselflies or 6 or more individuals for dragonflies (though for *Ischnura pumilio* 6 or more individuals will suffice and for *Orthetrum coerulescens* 21 or more individuals are needed).

It is recognised that fulfilling these abundance criteria may be difficult at a particular site so these abundance criteria can be replaced by a persistence criteria, which is the recording of breeding of the species on 2 or more occasions in the last 10 years.

Butterflies

Criteria

b. Sites supporting a butterfly species within list A in table 7.

c. Sites supporting a locally notable population of four or more of the species within list B in table 7.

Table 7 – Butterfly species of importance within Surrey

List A. Habitat Specialists	**List B. Other spp. of interest**
Silver-spotted Skipper (*Hesperia comma*)	Brown Hairstreak (*Thecla betulae*) (5)
Dingy Skipper (*Erynnis tages)*	White-letter Hairstreak (*Satyrium w-album*) (10)
Grizzled Skipper (*Pyrgus malvae*)	Small Copper (*Lycaena phlaeas*) (10)
Wood White (*Leptidea sinapsis*)	Brown Argus (*Aricia agestis*) (10)
Green Hairstreak (*Callophrys rubi*)	Common Blue (*Polyommatus icarus*) (20)
Small Blue (*Cupido minimus)*	Wall (*Lasiommata megera*) (any – v rapidly declining)
Silver-studded Blue (*Plebeius argus)*	Marbled White (*Melanargia galathea*) (40)
Chalkhill Blue (*Polyommatus coridon)*	Small Heath (*Coenonympha pamphilus*) (20)
Adonis Blue (*Polyommatus bellargus)*	
White Admiral (*Limenitis camilla)*	
Purple Emperor (*Apatura iris)*	
Small Pearl-bordered Fritillary (*Boloria selene)*	
Pearl-bordered Fritillary (*Boloria euphrosyne)*	
Dark Green Fritillary (*Argynnis aglaja*)	
Silver-washed Fritillary (*Argynnis paphia)*	
Grayling (*Hipparchia semele*)	

Application

The numbers in brackets should be used to determine whether a locally notable population is present. This should be the maximum number seen on a single visit.

Justification

These criteria have been developed by Butterfly Conservation. The presence of a breeding population of a butterfly species from list A, would indicate a good quality habitat worthy of SNCI selection. The presence of a notable population of four or more species within list B would indicate that the site has value as a lepidoptera site and could for example indicate that it has potential for habitat restoration.

Aculeates (Wasps, Ants & Bees)

Criteria

d. Sites with a Species Quality Score of greater than 4

Application
The Species Quality Score (SQS) for a site is calculated by first deducting all ants and social wasp and social bee species from the total number of Aculeate species for the site. Each of the remaining solitary species is given a quality score using the Archer scoring system as follows;

Status	Status Value
Very Rare	32
Rare	16
Scarce	8
Restricted	4
Widespread	2
Universal	1

The total quality score for the site is then divided by the total number of solitary species to give the Species Quality Score (SQS) for the site. At least 6 visits are likely to be required in order to obtain enough information to calculate an accurate SQS.

Justification
A local expert has advised that sites with a SQS of greater than 4 are likely to be of county importance for aculeates.

24 Vascular Plants

The selection of a site should be informed by expert opinion based on the biology of the individual species. Sites which meet the following criteria should be considered for selection;

Criteria

a. Sites supporting one or more species included in the latest national Red Data List for plants.

Application

The most up to date list should be referred to. At the time of writing, this is The Vascular Plant Red Data List for Great Britain (Cheffings & Farrell 2005).

b. Sites supporting an important assemblage or population(s) of a species included in the UK list of Biodiversity Action Plan (BAP) priority species.

Application

The most up to date list of UK BAP priority species should be used. At the time of writing the list was last updated in 2007.

c. Sites supporting a nationally scarce species.

Application

Reference should be made to Scarce Plants in Britain (Stewart et al, 1994) or any more recent updates such as The New Atlas of British and Irish Flora (Preston et al, 2002). An up to date complete list can be found on the JNCC website – www.jncc.gov.uk/species/plants.

d. Sites containing species identified by Surrey Botanical Society as rare and notable within Surrey.

Application

This should be based on the current draft list of Surrey notable plants species produced by Surrey Botanical Society. A County Rare Species Register is currently in preparation and will replace the draft list once completed.

e. Sites selected as Important Plant Areas by Plantlife.

Application

Plantlife hope to publish a list of Important Plant Areas in the UK in 2007.

Justification

Important Plant Areas are identified by Plantlife using the following criteria;
A: The site holds significant populations of species of global or regional concern.
B: The site has exceptionally rich flora in a regional context in relation to its biogeographic zone.
C: The site is an outstanding example of a habitat type of global or regional importance.

25 Lower Plants and Fungi

Lower plants and fungi are a difficult group to use for SNCI selection. There is a lack of up to date data. Many species need very specialist knowledge for identification, they are inconspicuous and often require microscopic examination for ID.
In many cases non-vascular plants may have very restricted distributions for example a single tree or stone. Wherever possible surveys should establish whether the species is more widespread in the local vicinity. If further information is not available the boundary of the SNCI should be drawn to include other similar habitats in the immediate locality.

Justification
The British non-vascular flora is one of the richest in Europe. While Britain's vascular flora consists of only about 18% of the total European vascular flora, the figure for bryophytes, for example, is about 70% (NCC, 1989). The species meeting the criteria below are the rarest and/or most threatened lower plant species in the British Isles and Britain has a national and international responsibility to conserve them throughout their distribution.

Sites which meet the following criteria should be considered for selection;

Criteria

a. Sites supporting one or more nationally rare or declining species as listed in the national Red Data Books.

Application
Reference should be made to the following publications;
- British Red Data Books Mosses and Liverworts (Church et al 2001),
- Red Data Books of Britain and Ireland: Stoneworts (Stewart & Church, 1992),
- Red Data Books of Britain and Ireland: Lichens Volume 1: Britain (Church et al, 1996) and the review carried out by Woods & Coppins (2003),
- A Red Data Book for fungi has not yet been published, however the following document can be referred to for guidance; Preliminary Assessment, The Red Data List of Threatened British Fungi (Shelley Evans, 2007).

b. Sites supporting an important assemblage or population(s) of a species included in the UK list of Biodiversity Action Plan (BAP) priority species.

Application
The most up to date list of UK BAP priority species should be used. At the time of writing the list was last updated in 2007.

c. Sites supporting a nationally scarce species.

Application
Nationally scarce species have been recorded from between 16 and 100 10km grid squares in Britain. A complete list of threatened, rare and scarce bryophyte and lichen species can be found on the JNCC website – www.jncc.gov.uk/species/plants. Nationally scarce stonewort species are listed in Guidelines for the selection of Sites of Special Scientific Interest: non-vascular

plants. Also refer to the Atlas of the Bryophytes of Britain and Ireland*, Vols. 1-3 (Hill et al, 1991-1994).*

d. Sites classified as Important Fungus Areas by Plantlife.

Justification

Important Fungus Areas are identified by Plantlife using the following criteria;
A: The site hold significant populations of rare fungal species which are of European or UK conservation concern. A site should be considered if it includes at least five species from: the provisional UK Red Data List (1992), UK Biodiversity Action Plan and/or Schedule 8 or the European Red Data List (A B) and/or species of European Concern (Bern Convention proposals).
B: The site has an exceptionally rich and well-recorded mycota in a UK context. A site should be considered if it has at least 500 recorded species.
C: A site which is an outstanding example of a habitat type of known mycological importance.
D: A nominated site which is considered to be important but for which further information is needed.

e. Sites classified as Important Stonewort Areas by Plantlife

Justification

Important Stonewort Areas are identified by Plantlife using the following criteria;
A: All significant sites of species listed on Schedule 8 of the Wildlife and Countryside Act 1981 (plus amendments); AND up to five best sites for additional red data list species.
B: All sites with five or more stonewort species present. OR all sites with one red list/near threatened species and at least two additional species.
C: All sites thought, or inferred to contain 5% or more of the national resource (by area), or the five 'best' sites of priority threatened habitats of major significance to stoneworts listed on Annex I of the EU Habitats Directive; OR up to five 'best' sites, of other threatened (but non-priority) habitats listed on Annex I.

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Appendix 1 Full names of NVC communities used in the habitat guidelines

Woodland communities

W1 *Salix cinerea-Galium palustre* woodland
W2 *Salix cinerea-Betula pubescens-Phragmites australis* woodland
W4c *Betula pubescens-Molinia caerulea* woodland *Sphagnum spp.* sub-community
W5 *Alnus glutinosa-Carex paniculata* woodland
W6 *Alnus glutinosa-Urtica dioica* woodland
W7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland
W12 *Fagus sylvatica-Mercurialis perennis* woodland
W13 *Taxus baccata* woodland
W14 *Fagus sylvatica-Rubus fruticosus* woodland
W15 *Fagus sylvatica-Deshampsia flexuosa* woodland

Grassland communities

MG4 *Alopecurus pratensis-Sanguisorba officinalis* grassland
MG5 *Cynosurus cristatus-centaurea nigra* grassland
MG8 *Cynosurus cristatus-Caltha palustris* grassland
U1 *Festuca ovina-Agrostis capillaries-Rumex acetosella* grassland
U2 *Deschampsia flexuosa* grassland
U3 *Agrostis curtisii* grassland
U4 *Festuca ovina-Agrostis capillaries-Galium saxatile* grassland
U20a *Pteridium aquilinum-Galium saxatile* community *Anthoxanthum odoratum* sub community
CG2 *Festuca ovina-Avenula pratensis* grassland
CG3 *Bromus erectus* grassland
CG4 *Brachypodium pinnatum* grassland
CG5 *Bromus erectus-Brachypodium pinnatum* grassland
CG6 *Avenula pubescens* grassland
CG7 *Festuca ovina-Hieracium pilosella-Thymus praecox/pulegioides* grassland

Wetland communities

M6 *Carex echinata-Sphagnum recurvum/auriculatum* mire
M21 *Narthecium ossifragum-Sphagnum papillosum* valley mire
M24 *Molinia caerulea-Cirsium dissectum* fen-meadow
M25 *Molinia caerulea-potentilla erecta* mire
M27 *Filipendula ulmaria-Angelica sylvestris* mire
M29 *Hypericum elodes-Potamogeton polygonifolius* soakway
S3 *Carex paniculata* swamp
S4 *Phragmites australis* swamp and reed-beds
S5 *Glyceria maxima* swamp
S6 *Carex riparia* swamp
S7 *Carex acutiformis* swamp
S8 *Scirpus lacustris ssp. Lacustris* swamp
S9 *Carex rostrata* swamp
S10 *Equisetum fluviatile* swamp
S12 *Typha latifolia* swamp

S13 *Typha angustifolia* swamp
S14 *Sparganium erectum* swamp
S15 *Acorus calamus* swamp
S16 *Sagittaria sagittifolia* swamp
S22 *Glyceria fluitans water-margin vegetation*
S23 Other water-margin vegetation
S26 *Phragmites australis-Urtica dioica* tall-herb fen
S27 *Carex rostrata-Potentilla palustris* tall-herb fen
S28 *Phalaris arundinaceae* tall-herb fen

Appendix 2 Plantlife's Criteria for the selection of Important Arable Plant Areas (Byfield & Wilson 2005)

	Criterion A: Threatened species	**Criterion B: Species richness**
Sites of European importance	**Select:** **All viable arable sites** thought, or inferred, to contain 5% or more, OR the five 'best'[1] sites (whichever is most appropriate), of the UK population of a species listed as *threatened*[2] on: - IUCN global red lists - European IUCN red lists - EU habitats Directive Annexes IIb or IVb - Bern Convention Appendix 1 and/or endemic or near endemic[3] species listed as threatened on UK red lists. (Note:currently no sites in the UK meet this criterion)	**Select:** **All arable sites** meeting the following thresholds according to the weighted evaluation scoring ststem for arable species assemblages: - chalk and limestone derived soils: 90+ - clay soils: 70+ - sands and freely-draining acidic soils: 70+
Sites of UK importance	**Select:** **All viable arable sites** thought, or inferred, to contain 3% or more of the UK population, OR **The 30 'best'** sites (whichever is most appropriate), of species listed as *critically endangered, Endangered or Vulnerable* in approved red lists; and/or UK BAP priority species.	**Select:** **All arable sites** meeting the following thresholds according to the weighted evaluation scoring ststem for arable species assemblages: - chalk and limestone derived soils: 45-89 - clay soils: 30-69 - sands and freely-draining acidic soils: 35-69
Sites of county importance	**Select:** **All additional populations** of species listed as *threatened*[2] in approved UK red lists; and/or as a UK BAP priority species (not included above); AND/OR **All populations** of species recorded in three or fewer localities in a specific county since 1995.	**Select:** **All arable sites** meeting the following thresholds according to the weighted evaluation scoring ststem for arable species assemblages: - chalk and limestone derived soils: 30-44 - clay soils: 20-29 - sands and freely-draining acidic soils: 20-34

Notes:

1. *Best sites are those of most significance for the long-term survival of the species in the UK, and are principally assessed on overall size of the population and its long-term viability.*
2. *Threatened species must be listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) according to the 2000 IUCN red list categories (IUCN 2001)*
3. *Near endemic species is a plant that is found in a very limited range within Europe. "For practical purposes this may be defined as a species that has more of its range within one country and occurs in no more than 2-3 countries in total, or that occurs only within one geographical unit, such as Carpathians" (Anderson 2002).*