

GUIDELINES FOR THE SELECTION OF LOCAL WILDLIFE SITES

amended September 2011



Northumberland



Working with Wildlife

Northumberland **Biodiversity** Partnership

NORTHUMBERLAND

Northumberland County Council

Newcastle
City Council 



North Tyneside Council

CONTENTS

SECTION	PAGE
1 INTRODUCTION	3
2 FUNCTIONS OF THE SYSTEM	4
3 THE SELECTION OF LOCAL WILDLIFE SITES	5
4 INTRODUCTION TO THE GUIDELINES	6
5 GUIDELINES FOR THE SELECTION OF LOCAL WILDLIFE SITES	
HABITAT GUIDELINES	7
SPECIES GUIDELINES	12
NOTES	16
BIBLIOGRAPHY	17
APPENDICIES	19
1 Ancient Semi-natural Woodland Indicators of Lowland Northumberland NVC Community Types	20
2 Fen Indicator Species	22
3 TWINSPAN Classification of Standing Water Sites	23
4 A Scoring System for the Selection of Sites with Assemblages of Amphibians	24
5 Breeding Bird Assemblages	25

1 INTRODUCTION

- 1.1 A Local Wildlife Site (LWS), formerly known as Site of Nature Conservation Importance (SNCI), is defined as a discrete area of land, which is considered to be of significance for its wildlife (Local Wildlife Sites), and/or for its geological/geomorphological features (Local Geological Sites) in at least a County context.
- 1.2 The Local Sites system and the Regionally Important Geological/geomorphological Sites (RIGS) system may overlap where a site has both biological and geological/geomorphological interests.
- 1.3 For the purpose of this document, 'County' and 'Northumberland' are taken to include the administrative districts of Northumberland, North Tyneside and the City of Newcastle upon Tyne, unless otherwise stated.
- 1.4 These guidelines are designed to fulfil the requirement in paragraph 9 of Planning Policy Statement 9 for criteria-based policies for sites of regional and local biodiversity interest.

2 FUNCTIONS OF THE SYSTEM

- 2.1 The overall aim of the Local Site system is to provide a strategic approach to the identification and protection of sites with substantive nature conservation value throughout Northumberland.
- 2.2 To update and rationalise the system of Local Site designation in Northumberland to conform with recent changes to legislation driven by UK government commitment to, amongst other things, the EU Habitats Regulations, the Biodiversity Convention, and the Local Government Act 2000 - Community Strategies and the Natural Environment and Rural Communities Act 2006;
- 2.3 To identify those areas of the county which, together with SSSI and other measures, best display the range of variation in biodiversity across Northumberland, including features which are unique and characteristic;
- 2.4 To set standards to enable consistent and defensible designation of Local Sites;
- 2.5 To enhance the ability of Northumberland Wildlife Trust and others to safeguard sites by developing an understanding amongst decision makers and developers of the importance of the county's biodiversity and through the consideration of strategic protection of nature conservation resources;
- 2.6 To inform landowners of the interest of their sites, and through liaison, to encourage sympathetic management;
- 2.7 To provide a focus for the monitoring and recording of biodiversity targets.

3 THE SELECTION OF LOCAL WILDLIFE SITES

- 3.1 The selection of all Local Wildlife Sites in Northumberland, from the full range of habitats present in the county, will be undertaken through the rigorous application of the following guidelines. The procedure for the confirmation of Local Wildlife Sites selection will be carried out by the Local Wildlife Sites Partnership.
- 3.2 Site boundaries will, where possible, be selected to encompass the feature of wildlife interest. However, due to the difficulties of recognising boundaries on the ground and to facilitate appropriate management, they will follow easily identifiable landmarks. This will be in most cases existing field boundaries that enclose the feature of value. This will inevitably lead to the inclusion of areas of lower value than that selected by the criteria. These areas will not be included when comparing eligibility against the minimum size threshold (except for mosaic habitats). Buffer zones will not be included within the site boundaries (except where stated in the habitat criteria).
- 3.3 Local Wildlife Sites will complement and not overlap with the framework of Sites of Special Scientific Interest (SSSI). Local Wildlife Sites may however overlap with SSSI designations when one is geological/geomorphological and the other is biological.
- 3.4 Local Nature Reserves, denotified SSSI, Wildlife Trust Reserves and other nature reserves will not automatically be selected as Local Wildlife Sites, but will be subject to qualification against the guidelines. Gardens will not normally be considered for selection.
- 3.5 Prospects for safeguarding sites in perpetuity are not taken into account in selection. Thus, sites under imminent threat of destruction may be selected as Local Wildlife Sites on the basis of their current interest. Local Sites are a “material consideration” in planning terms and designation may, therefore, promote protection, mitigation or compensation.

4 INTRODUCTION TO GUIDELINES

- 4.1 The guidelines are set out in two sections: those which deal with character or quality of the habitats, and those that relate to the occurrence of certain species or groups of species. Guidelines for the selection of sites with a geological and/or geomorphological have been produced separately (REFERENCE NEEDED).
- 4.2 Target species and habitats have been chosen with regard to the Northumberland Red Data Book (Kerslake, 1998) and current environmental legislation, including the Convention on Biological Diversity and subsequent Local/National Biodiversity Action Plans (BAPs/LBAPS); Habitat and Birds Directives and other legislation where stated. The criteria established by Ratcliffe (1977) in the “Nature Conservation Review”, have been used as a basis to derive the habitat and species guidelines within this document, as regards biological sites. However, due to population density and hence urbanisation being concentrated within the south east corner, the added value of sites within an urban setting has been recognised (HOW?), for example relaxation of the criteria will occur in order to allow for consideration of the social value of individual sites in an urban environment.
- 4.3 The guidelines are based upon information that is presently available on habitats and species in Northumberland. It is accepted that more information is available on some habitats and species than it is for others. Certain taxonomic groups, particularly invertebrates, have been subject to little or no systematic surveying. The apparent interest of a site can be greatly influenced by recording effort, thus where information is limited, current data for such groups must be interpreted carefully.
- 4.4 In addition to limits imposed by current information, nature is dynamic and vulnerable to change. It will therefore be necessary to update and modify thresholds within these guidelines to reflect increased scientific knowledge and the changing status of habitats and species both nationally and locally. It is the aim to review the guidelines every five years. Sites will be subject to review as these thresholds change.
- 4.5 Local Wildlife Site listings will allow for the inclusion of “candidate” and “review” sites, which will be treated as confirmed sites, pending the availability of adequate data that will allow sites to be confirmed, retained or struck off.
- 4.6 The selection of Local Wildlife Sites will be strongly guided by the thresholds set out in this document, but this is not a simplistic process of comparison between the species and habitat recorded from a site and the necessary threshold values. The number of variables that make up the ecological value of a site is large, and it is not possible to be quantitative about many of these. There will always be a need for best professional judgement in site selection, particularly when assessing a “good” example of an NVC habitat, which will therefore rely on judging the merits of one site relative to another.

5 GUIDELINES FOR THE SELECTION OF LOCAL WILDLIFE SITES

- 5.1 All terms that require further explanation can be found in the **Notes** section at the end of the guidelines.
- 5.2 Local Wildlife Site boundaries will follow the nearest existing field/on the ground boundaries to the feature of interest. Areas of highest/qualifying habitat will be target noted.

HABITAT GUIDELINES

- 5.3 Habitat types have been selected to include:
- A characteristic representation for Northumberland
 - Those habitats that are rare, scarce or rapidly declining regionally, nationally and/or internationally i.e. UK BAP and Local BAP key habitats.
- 5.4 Unless severely degraded (note i), all sites in the county which contain habitats fulfilling at least one of the following guidelines may be designated as Local Wildlife Sites.
- 5.5 Closely scattered fragments of a single habitat type may also be considered for selection as one Local Wildlife Site. For fragmented sites, the boundary will be assessed with each individual case.
- 5.6 When references are made to plants within the habitat guidelines, this should be taken to mean vascular plants unless otherwise specified.

WOODLANDS

- 5.7 Ancient Woodland – all woodland on the county Inventory of Ancient Woodland as carrying a semi-natural canopy (note ii), unless post-inventory survey has shown this record to be erroneous, or has revealed severe degradation.
- 5.8 Woodland recorded on the provisional county inventory as carrying a replanted coniferous or broad-leaved crop, which is shown to retain, on the basis of post-inventory survey, restorable elements of its previous semi-natural character, and other extant features of wildlife interest. These should include both the presence of at least 10 ancient woodland indicator species (excluding upland woodland, upland being defined as above an altitude of 250m) (Appendix 1) and significant features such as herb-rich rides, glades, or pockets of semi-natural canopy.
- 5.9 Woodland that is not on the Inventory, but which carries a semi-natural canopy, and meets **all** of the following qualifications.
- It has a diverse and well developed structure (ground flora/shrub layer/canopy);
 - It is not irreversibly degraded by grazing, domination by invasive and/or non-native species or by other means;
 - The features of value are present in at least 50% of the woodland area;
 - Is 0.5ha or greater.
- 5.10 All good examples of nationally rare NVC woodland communities, together with those at or near the limit of their geographical range in Northumberland (note iii) (communities listed in Appendix 2)
- 5.11 Pasture woodlands or parklands that contain rare native and/or veteran trees (note iv). The whole pasture woodland or parkland will not be eligible for qualification as a Local Wildlife Site under this guideline alone. As a guide, the boundary of the site will include the

surrounding area, within a distance equal to the height of the trees (unless linear and/or man-made features determine otherwise). In exceptional cases, single trees may be considered for inclusion here.

- 5.12 Areas of scrub may be selected on notable species grounds, according to species guidelines within this document.

HEDGEROWS

- 5.13 Recently created hedgerows will not generally qualify. Present knowledge of the state and quantity of hedgerows in Northumberland is poor. Until a systematic survey of hedgerows has been carried out, only hedgerows where adequate data is currently available will be assessed against the following criteria.
- All ancient (note ix) or established hedgerows greater or equal to 100m in length (gaps are not counted as part of the hedge) which contain at least 4 woody species, on average in a 30m length and at least 4 ancient woodland indicator species (Appendix 1).
 - All hedgerows as described above which are less than 100m in length but which fulfil a strategic function by linking wildlife sites to produce an enhanced ecological unit.
 - All ancient or established hedgerows (note ix) with associated veteran trees (note iv) and at least 4 ancient woodland indicator species (Appendix 1).

GRASSLANDS

- 5.14 All grassland sites will be surveyed with a minimum of 5 quadrats/per site.
- 5.15 All good examples of nationally or locally rare NVC grassland communities, together with those at or near the limit of their geographical range in Northumberland (note iii) (example communities listed in Appendix 2). Sites should normally be 0.2 ha or greater.
- 5.16 All upland acid grasslands, mesotrophic and calcicolous (including Whin Sill) grassland sites, normally of 0.2ha or greater, with a high diversity of plant species (15 or more species on average per m²).
- 5.17 All lowland acid grasslands, normally of 0.5ha or greater, unless severely degraded (note i).

LOWLAND HEATH

- 5.18 All lowland heathland sites unless severely degraded (note i), where lowland habitats are defined as those lying below an altitude of 250m.

LOWLAND WETLANDS

- 5.19 Where lowland habitats are defined as those lying below an altitude of 250m
- 5.20 All good examples of nationally or locally rare NVC communities (note iii). Sites should **normally** be 0.5 ha or greater.
- 5.21 All examples of fens, flushes, seepages, springs etc, with 4 or more species from the list in Appendix 3.

- 5.22 All examples of reed beds. Site should normally be 0.1ha or greater.

FRESH WATER HABITATS

PONDS, LAKES, GRAVEL PITS AND RESERVIORS

- 5.23 All natural lakes unless severely degraded (note i).
- 5.24 Sites, other than natural lakes, with higher than average number of submerged, floating and emergent plant species for a community type (see Appendix 4).
- 5.25 Sites with 3 or more species of *Potamogeton*.

RIVERS AND STREAMS

- 5.25 Sites Section of river and stream over 500m in length that have a Habitat Quality Analysis (HQA) class 1 score (Excellent) and General Quality Assessment (GQA) grade A or B for biological and chemical monitoring. Sections of high quality but less than 500m in length will be considered, particularly in urban areas.

COASTLAND

- 5.26 All natural and semi-natural coastal and estuarine sites, including the intertidal zone. Sites should normally be 0.5 ha or greater.
- 5.27 All sites that show a transition between coastal communities and adjacent semi-natural habitat, usually 0.5 ha or greater.

UPLAND HABITATS

- 5.28 Where upland habitats are defined as those lying above an altitude of 250m.
- 5.29 Upland heath comprises of vegetation on land above the level to which farmland has been enclosed into fields, and which comprises at least 25% cover of ericoids. Sites should normally be 10ha or greater.
- 5.30 Blanket bog comprises of vegetation on land above the level to which farmland has been enclosed into fields and in which Sphagnum cover is at least 20%. Sites should normally be 10ha or greater.
- 5.31 All raised and intermediate mires containing 1 of the following species:

<i>Drosera anglica</i>	}	Great Sundew
<i>Sphagnum imbricatum</i>		
<i>S. fuscum</i>	}	Bog mosses
<i>S. pulchrum</i>		

- 5.32 All other raised and intermediate mires containing 7 or more of the following species:

<i>Narthecium ossifragum</i>	Bog Asphodel
<i>Andromeda polifolia</i>	Bog Rosemary
<i>Eriophorum angustifolium</i>	Common Cottongrass
<i>Vaccinium oxycoccus</i>	Cranberry

<i>Erica tetralix</i>	Cross-leaved Heath
<i>Trichophorum cespitosum</i>	Deergrass
<i>Drosera rotundifolia</i>	Round-leaved Sundew
<i>S. magellanicum</i>	} Bog mosses
<i>S. papillosum</i>	

- 5.33 All other terrestrial upland habitats that have features of particular note (e.g. valuable bird assemblages or the presence of rare plant spp) specified under species guidelines.

HABITAT MOSAICS

- 5.34 Sites with 2 or more adjacent semi-natural habitats in mosaic may warrant recognition as Local Wildlife Site where individually one or more of the habitats may fail to qualify on single habitat or notable species grounds.
- 5.35 Where mosaics occur, in order to qualify, at least one of the habitats in the mosaic should be considered a borderline site. This component should constitute a significant proportion of the whole mosaic, usually 25% or more.

ARTIFICIAL HABITATS

DISUSED QUARRIES

- 5.36 These will usually be assessed on other guidelines, but sites which demonstrate particularly good examples of active succession from bare ground towards wildlife-rich grassland, heathland or woodland communities or those that may qualify on species grounds will be included. Such sites should normally be 0.5 ha or greater.

METALLIFEROUS/CALAMINARIAN GRASSLANDS

- 5.37 Those sites either associated with mines or alluvial systems, which carry good examples of flora showing adaptations to heavy metal-rich soils. Sites may be very small (much less than 0.5 ha) but even the smallest sites can be of considerable interest. The most important areas tend to be the more contaminated bare and stony patches, where the only vascular plants are highly specialised metallophytes and there is often a highly diverse flora of terricolous lichens. Sites with at least 2 of the following metallophyte indicator species will be designated:

Vascular plants

<i>Armeria maritima</i> (inland)	Thrift
<i>Epipactis dunensis</i>	Dune Helleborine
<i>Minuartia verna</i>	Spring Sandwort
<i>Thlaspi caerulescens</i>	Alpine Penny-cress
<i>Viola lutea</i>	Mountain Pansy

Lichens

<i>Cladonia cervicornis</i> var. <i>verticillata</i>
<i>Epilichen scabrosus</i>
<i>Peltigera neckeri</i>
<i>Stereocaulon</i> species (other than <i>S. vesuvianum</i>)

- 5.38 All sites with *Peltigera venosa* will automatically be designated.

OTHER ARTIFICIAL HABITATS

- 5.39 Must qualify under other habitat or species guidelines. Linear features such as roadside verges and railway track-sides that meet other guidelines except in terms of minimum size will normally be selected where they are 100m in length or greater.

URBAN GREEN SPACES

- 5.40 Urban sites that do not qualify under other habitat or species guidelines may still make a significant contribution to nature conservation. Their position within an urban context allows many more people to experience and interact with nature and this considerably enhances their importance.
- 5.41 Urban green spaces will be selected if they almost qualify as Local Wildlife Site on habitat or notable species grounds (species diversity may be lower and the site may not meet the minimum size criteria etc), if it can be shown that the position of the site relative to other available habitats and/or social value compensate for the lower diversity, size etc.. For example, the site may not meet the minimum size threshold but may lie within a known wildlife corridor.

SPECIES GUIDELINES

- 5.42 Species guidelines will be used unless Habitat Criteria have already been met. Sites will be selected for the presence of rare or notable species, or outstanding assemblages of species, where those species are known to occur naturally and are not introduced, unless part of a species recovery programme. The species listed are currently known, or are likely, to occur in Northumberland, but should other nationally rare or scarce species occur these would also be eligible.
- 5.43 Site boundaries will generally be selected to encompass the feature of wildlife interest i.e. the total area thought to support that species as far as can be determined, unless otherwise stated in the guidelines. However, many species listed in these guidelines are indicators of good habitat quality and therefore, these sites may qualify for designation under habitat guidelines. In these instances boundaries will be drawn up according to the habitat qualification (species qualification will still be noted).

VASCULAR PLANTS

- 5.44 All sites where one or more nationally rare or scarce species, as listed in the national Red Data Book, occur (Stewart *et al*, 1994; Wigginton, 1999).
- 5.45 All sites where one or more UK BAP priority species occur.

BRYOPHYTES, LICHENS AND FUNGI

- 5.46 Sites where one or more UK BAP priority species have been recorded within the past ten years (note v).
- 5.47 Sites where one or more nationally rare or scarce species have been recorded in the last ten years (note v) (Hill *et al*, 1991, 1992, 1994).
- 5.48 Sites where 7 or more species of waxcaps have been recorded in the last 10 years
- 5.49 Sites where 12 or more species of waxcaps, fairy clubs, earth tongues and/or pink gills have been recorded in the last 10 years

MAMMALS

DORMOUSE *Muscardinus avellanarius*

- 5.50 All sites with dormouse confirmed in the past five years, usually with associated semi-natural habitat selected under other criteria.

RED SQUIRREL *Sciurus vulgaris*

- 5.51 The presence of red squirrel will be recorded as part of a Local Site survey; however the presence of red squirrel on their own would not normally justify Local Site status.

HARVEST MOUSE *Micromys minutus*

- 5.52 All sites with harvest mouse recorded in the last five years (note v), usually with associated semi-natural habitat selected under other criteria.

WATER VOLE *Arvicola terrestris*

- 5.53 All sites with water vole recorded in the past five years (note v).

BADGER *Meles meles*

- 5.54 Setts will be recorded separately from the Local Wildlife Site system. Badger setts on their own will not justify Local Wildlife Site status.

BATS

- 5.55 Any site that regularly supports a hibernation or nursery roost of any species of bat, as included in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is not generally intended that this guideline will be applied to domestic, agricultural or industrial buildings, whether or not they are in use. However, consideration may be given to certain types of artificial structures, such as tunnels, bridges, retaining walls and mine shafts.

Nine species are recorded as breeding in Northumberland:

Whiskered	<i>Myotis mystacinus</i>
Brandt's	<i>Myotis brandtii</i>
Natterer's	<i>Myotis nattereri</i>
Daubenton's	<i>Myotis daubentonii</i>
Noctule	<i>Nyctalus noctula</i>
Common pipistrelle	<i>Pipistrellus pipistrellus</i>
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>
Nathusius pipistrelle	<i>Pipistrellus nathusii</i>
Brown Long-eared	<i>Plecotus auritus</i>

(Leisler's bat (*Nyctalus leisleri*) has been recorded once in the county)

BIRDS

- 5.56 Sites should only be designated where there is a clear conservation advantage in doing so. This will normally be where there is a need to protect or manage the habitat where the birds display and/or feed or in the vicinity of their nest site.

WINTER POPULATIONS

- 5.57 All sites regularly (note viii) holding greater than 0.5% of the national population of any wintering or passage species or sites regularly holding more than 5000 birds.

BREEDING POPULATIONS

- 5.58 All sites regularly (note viii) holding more than 10% of the Northumberland breeding population of a species.

BIRD ASSEMBLAGES

- 5.59 All sites regularly (note viii) holding exceptionally good breeding bird species assemblages for that particular habitat. (See **Appendix 6** for threshold values for each habitat type).

UNUSUAL FEATURES

- 5.60 Any site regularly (note viii) holding significantly high numbers of a key breeding or wintering species or unique features of a species or assemblage.

FISH

- 5.61 Any stretch of river where the following species of fish have been regularly recorded (note viii):

Allis Shad	<i>Alosa alosa</i>
Twaite Shad	<i>Alosa fallax</i>
River Lamprey	<i>Lampetra fluviatilis</i>
Brook Lamprey	<i>Lampetra planeri</i>
Marine Lamprey	<i>Petromyzon marinus</i>

AMPHIBIANS

- 5.62 All waterbodies that support Great Crested Newt* **and**

- All terrestrial habitat** (unless the habitat can be proven to be unsuitable for the species) within 250m of a waterbody supporting a population of Great Crested Newt where the population size is undetermined, **or**;
- All terrestrial habitat** (unless the habitat can be proven to be unsuitable for the species) within 250m of a waterbody supporting a small population of Great Crested Newt (as defined by Great Crested Newt Mitigation Guidelines, 2001) **or**;
- All terrestrial habitat** (unless the habitat can be proven to be unsuitable for the species) within 500m of a waterbody supporting a medium or large population of Great Crested Newts (as defined by Great Crested Newt Mitigation Guidelines, 2001).

*GCN must be recorded within the last five years (note v)

**Domestic gardens would ordinarily be excluded.

- 5.63 All sites where four native amphibian species have been recorded in the last 5 years (note v).
- 5.64 All sites that regularly (note viii) support 'exceptional' populations of any amphibian species (see Appendix 5).
- 5.65 All sites that regularly (note viii) support 'good' populations of 3 or more amphibian species (see Appendix 5).

REPTILES

- 5.66 All sites where the following species have been recorded in the last 5 years (note v):

Grass Snake	<i>Natrix natrix</i>
Slow Worm	<i>Anguis fragilis</i>

INVERTEBRATES

BUTTERFLIES

5.67 All sites that regularly support one of the following butterfly species (note viii):

Green Hairstreak	(<i>Callophrys rubi</i>)	national decline
Purple Hairstreak	(<i>Quercusia quercus</i>)	national decline
White-letter Hairstreak	(<i>Satyrrium w-album</i>)	regional decline
Small Pearl-bordered Fritillary *	(<i>Boloria selene</i>)	national decline
Dark Green Fritillary	(<i>Argynnis aglaja</i>)	regional decline
Dingy Skipper	(<i>Erynnis tages</i>)	national decline
Grayling	(<i>Hipparchia semele</i>)	national decline
Large Heath*	(<i>Coenonympha tullia</i>)	national decline 72% of all English sites are in Northumberland

* In order to qualify as regularly supporting these species, the species should have been recorded at least once in the last 10 years.

5.68 All sites that regularly support 15 or more species of butterfly (note viii).

DRAGONFLIES AND DAMSELFLIES

5.69 Twenty-four species of dragonfly are found in the North East, and of these only ten are likely to be encountered regularly.

5.70 Sites with assemblages of 7 or more species of odonata recorded in the last five years (note v).

MOLLUSCS

5.71 All sites that support populations of **Freshwater Pearl Mussel** (*Margaritifera margaritifera*)

CRUSTACEAN

5.72 All sites that support **White-clawed Crayfish** (*Austropotamobius pallipes*)

OTHER INVERTEBRATES

5.73 All sites that support populations of UK BAP Priority species recorded in the last five years (note v).

5.74 All sites that support nationally rare or scarce species (Shirt, 1987 and Bratton, 1991).

5.75 All sites that support populations of 3 or more native species of invertebrate (including above categories) that are rare in the county, ie species known in fewer than 10 localities, but only where the county distribution of that species has been adequately recorded (note vi).

NOTES

- (i) “Severely degraded” is defined as a site where, if management were to be immediately changed to the optimum, the site would be unlikely to regain most of its previous nature conservation interest within 10 years.
- (ii) Semi-natural refers to modified types of vegetation in which the dominant and constant species are accepted natives and in which the structure of the community conforms to the range of natural vegetation types.
- (iii) Where NVC data are not available, the assemblage of species need only be indicative of NVC community type. Some NVC types are intrinsically poor in species and their lack of richness should not necessarily be taken as an indication of lesser worth.
- (iv) Veteran tree is defined as one which has significant decaying timber within the canopy or which has developed heart-rot and/or rot holes. Sap runs are an additional feature of importance.
- (v) Firm records more than five years old may be acceptable if the complete loss of the species at the site is in doubt, and the necessary conditions remain.
- (vi) Listed in the Red Data Book for Northumberland (Kerslake, 1998).
- (vii) ‘Contributory factor’ means that if an area is **either** almost of LOCAL SITE quality on habitat grounds and has 1 of these species **or** it does not almost qualify through habitat guidelines but it has a combination of 2 or more of these species, it will be considered for selection as an LOCAL SITE.
- (viii) For the purpose of site selection “regularly” is defined as occurring in at least 3 out of the most recent 5 years for which data is available over the previous ten years.
- (ix) “Ancient hedgerows” refers to those that pre-date the 19th century Enclosure Acts (as defined in the ‘*Ancient and/or species-rich hedgerows – a costed Habitat Action Plan*’ The UK Steering Group Report Vol. 2, 1995).
- (x) Squirrel Reserve is defined in the Red Squirrel Species Action Plan for North East England 2001 – 2006, Appendix 1, Reynolds *et al* (2001).

BIBLIOGRAPHY

- Asher J., Warren M., Fox R., Harding P., Jeffcoate G. & Jeffcoate S. (2001) *The Millenium Atlas of Butterflies in Britain and Ireland*. Oxford University Press, Oxford.
- Baker J. (ed) (2001) *Your Wildlife. Newcastle Biodiversity Action Plan*. Newcastle Biodiversity Partnership.
- Bratton, J. H. (ed.) (1991) *British Red Data Books: 3. Invertebrates other than insects*. JNCC, Peterborough.
- Carter A. (1988) *Northumberland Inventory of Ancient Woodland (Provisional)*. Nature Conservancy Council, Peterborough.
- Cooke R. (1987) *Tyne and Wear Inventory of Ancient Woodland (Provisional)*. Nature Conservancy Council, Peterborough.
- Day J. C., Hodgson M. S. & Rossiter B. N. (1995) *The Atlas of Breeding Birds in Northumbria*. Northumberland & Tyneside Bird Club, Newcastle.
- Department of the Environment (1997) *"The hedgerow regulations: your questions answered"*.
- English Nature & RSPB, *The Lowland Heathland County Inventory*.
- Feige D. (ed) (2000) *Working For Wildlife, The Northumberland Biodiversity Action Plan*. Northumberland Biodiversity Steering Group, Northumberland.
- Hill M. O., Preston C. D. & Smith A.J.E (eds). *Atlas of the bryophytes of Britain and Ireland* Volume 1 (1991) *Liverworts*; Volume 2 (1992) *Mosses (except Diplolepideae)*; Volume 3 (1994) *Mosses (Diplolepideae)*. Harley Books.
- Kerslake L. (ed) (1998) Red Data Book For Northumberland. *The Transactions of the Natural History Society of Northumbria*, **58** Part 2.
- Nature Conservancy Council (1989) *Guidelines for the selection of biological SSSIs*.
- Northumberland National Park Authority. *Biodiversity Action Plan For Northumberland National Park*.
- ODPM (2005) *Planning Policy Statement 9: Biodiversity and Geological Conservation*
- Ratcliffe D. A. (1977) *A Nature Conservation Review*. Cambridge University Press, Cambridge.
- Reynolds J. & Bentley S. (2001) *Selecting Refuge Sites for Red Squirrel Conservation*. Paper prepared for UK Red Squirrel Group.
- Rodwell J. S. (ed.) (1991a) *British Plant Communities Vol. 1, Woodlands and Scrub*. Cambridge University Press, Cambridge.
- Rodwell J. S. (ed.) (1991b) *British Plant Communities Vol. 2, Mires and Heath*. Cambridge University Press, Cambridge.
- Rodwell J. S. (ed.) (1992) *British Plant Communities Vol. 3, Grasslands and Montane Communities*. Cambridge University Press, Cambridge.

Rodwell J. S. (ed.) (1995) *British Plant Communities Vol. 4, Aquatic Communities, swamps and tall-herb fens*. Cambridge University Press, Cambridge.

Rodwell J. S. (ed.) (2000) *British Plant Communities Vol. 5, Other Communities*. Cambridge University Press, Cambridge.

RSPB (1996) *Birds of conservation concern in the United Kingdom, Channel Islands and Isle of Man*.

Shirt D. B. (ed.) (1987) *British Red Data Books: 2. Insects*. Nature Conservancy Council.

Stace C. (1997) *New Flora or the British Isles*, 2nd Edition, Cambridge University Press, Cambridge

Stewart A., Pearman D. A. & Preston C. D. (1994) *Scarce plants in Britain*. JNCC, Peterborough.

Swan G. (1993) *Flora of Northumberland*. The Natural History Society of Northumbria, Newcastle upon Tyne.

UK Biodiversity Steering Group (1995) *Biodiversity: The UK Steering Group Report, Vol 2: Action Plans*. HMSO, London.

Wigginton M. J. (1999) *British Red Data Books: 1. Vascular Plants* (3rd edition). JNCC, Peterborough.

APPENDICES

APPENDIX 1

Ancient semi-natural woodland indicators in lowland Northumberland

A minimum of **10 species** should be present.

<i>Acer campestre</i>	field maple
<i>Adoxa moschatellina</i>	moschatel
<i>Allium ursinum</i>	ramsons
<i>Anemone nemorosa</i>	wood anemone
<i>Arum maculatum</i>	lords-and-ladies
<i>Brachypodium sylvaticum</i>	false brome
<i>Bromopsis ramosa</i>	hairy-brome
<i>C. paniculata</i>	greater tussock-sedge
<i>C. remota</i>	remote sedge
<i>C. sylvatica</i>	wood-sedge
<i>Campanula latifolia</i>	giant bellflower
<i>Carex laevigata</i>	smooth-stalked sedge
<i>Chrysosplenium alternifolium</i>	alternate-leaved golden-saxifrage
<i>Circaea x intermedia</i>	upland enchanter's-nightshade
<i>Elymus caninus</i>	bearded couch
<i>Epipactis helleborine</i>	broad-leaved helleborine
<i>Equisetum sylvaticum</i>	wood horsetail
<i>Euonymus europaeus</i>	spindle
<i>F. gigantea</i>	giant fescue
<i>Festuca altissima</i>	wood fescue
<i>Gagea lutea</i>	yellow star-of-Bethlehem
<i>Galium odoratum</i>	woodruff
<i>Goodyera repens</i>	creeping lady's-tresses
<i>Gymnocarpium dryopteris</i>	oak fern
<i>Hordelymus europaeus</i>	wood barley
<i>Hyacinthoides non-scripta</i>	bluebell
<i>Juniperus communis</i>	juniper
<i>Lathraea squamaria</i>	toothwort
<i>Luzula pilosa</i>	hairy woodrush
<i>M. uniflora</i>	wood melick
<i>Melampyrum pratense</i>	common cow-wheat
<i>Melica nutans</i>	mountain melick
<i>Mercurialis perennis</i>	dog's mercury
<i>Milium effusum</i>	wood millet

<i>Myosotis sylvatica</i>	wood forget-me-not
<i>Neottia nidus avis</i>	bird's-nest orchid
<i>Oxalis acetosella</i>	wood sorrel
<i>Paris quadrifolia</i>	herb-Paris
<i>Phegopteris connectilis</i>	beech fern
<i>Poa nemoralis</i>	wood meadow-grass
<i>Polystichum aculeatum</i>	hard shield-fern
<i>Polystichum setiferum</i>	soft shield-fern
<i>Ranunculus auricomus</i>	goldilocks buttercup
<i>Ribes spicatum</i>	downy currant
<i>Sanicula europaea</i>	sanicle
<i>Stellaria nemorum</i>	wood stitchwort
<i>Tilia cordata</i>	small-leaved lime
<i>Veronica montana</i>	wood speedwell
<i>Viburnum opulus</i>	guelder rose
<i>Vicia sylvatica</i>	wood vetch

APPENDIX 2

NVC Types

Taken from Rodwell (1991a, 1991b, 1992, 1995 & 2000) and Nature Conservancy Council (1989)

WOODLAND COMMUNITIES

W3, *Salix pentandra* – *Carex rostrata*

W5, *Alnus glutinosa* - *Carex paniculata*

W7, *Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum*

W17, *Quercus petraea* – *Betula pubescens* – *Dicranum majus*

W19, *Juniperus communis* ssp. *communis* – *Oxalis acetosella*

GRASSLAND COMMUNITIES

MG2, *Arrhenatherum elatius* – *filipendula ulmaria* - tall herb grassland, 1 in Cheviots

MG3, *Anthoxanthum odoratum* – *Geranium sylvaticum* 'herbie meadow'

MG4, *Alopecurus pratensis* – *Sanguisorba officinalis*

CG10, *Festuca ovina* – *Agrotis capillans* – *Thymus praecox* (whin grassland)

U7, *Nardus stricta* – *Carex bigelowii* grass-heath

U10, *Carex bigelowii* – *Racomitrium lanuginosum*

U16, *Luzula sylvatica* – *Vaccinium myrtillus* tall-herb

U21, *Cryptogramma crista* – *Deschampsia flexuosa*

APPENDIX 3 Fen Indicator Species

4 or more from the following list:

<i>Anagallis tenella</i>	Bog pimpernel
<i>Carex viridula Ssp brachyrrhyncha</i>	Yellow sedge
<i>Carex dioica</i>	Dioecious sedge
<i>Carex hostiana</i>	Tawny sedge
<i>Carex pulicaris</i>	Flea sedge
<i>Dactylorhiza purpurella</i>	Northern marsh-orchid
<i>Dactylorhiza incarnata</i>	Early marsh-orchid
<i>Eleocharis quinqueflora</i>	Few-flowered spike-rush
<i>Equisetum variegatum</i>	Variegated horsetail
<i>Eriophorum latifolium</i>	Broad-leaved cottongrass
<i>Gymnadenia conopsea</i>	Fragrant orchid
<i>Menyanthes trifoliata</i>	Bogbean
<i>Myosotis stolonifera</i>	Pale forget-me-not
<i>Parnassia palustris</i>	Grass of parnassus
<i>Pedicularis sylvatica</i>	Lousewort
<i>Pinguicula vulgaris</i>	Common butterwort
<i>Sagina nodosa</i>	Knotted pearlwort
<i>Salix repens</i>	Creeping willow
<i>Samolus valerandi</i>	Brookweed
<i>Scutellaria galericulata</i>	Skullcap
<i>Selaginella selaginoides</i>	Lesser clubmoss
<i>Triglochin palustris</i>	Marsh arrowgrass
<i>Trollius europaeus</i>	Globeflower
<i>Valeriana dioica</i>	Marsh valerian

APPENDIX 4

TWINSpan classification of standing water sites – submerged and floating vegetation (Guidelines for selection of biological SSSIs, Table 12, p125)

Community Type	1	2	3	4	5		6	7	8	9	10
					A	B					
<i>Potamogeton polygonifolius</i>	II	IV	III								
<i>Utricularia intermedia</i>		II									
<i>Lobelia dortmanna</i>		IV	III		II						
<i>Sparganium angustifolium</i>		II	III								
<i>Isoetes lacustris</i>			III								
<i>Subularia aquatica</i>			II								
<i>Myriophyllum alterniflorum</i>		III	IV	IV	V*						
<i>Sparganium minimum</i>					II						
<i>Juncus bulbosus</i>	V*	IV	V*	II	III						
<i>Scirpus fluitans</i>		II									
<i>Sphagnum</i> spp.	IV										
<i>Nymphaea alba</i>		III			III	V*				IV	
<i>Potamogeton alpinus</i>					II						
<i>Nitella</i> spp.			II		IV*						
<i>Callitriche hamulata</i>			II		II						
<i>Littorella uniflora</i>		IV	V*	V*	V*		II	III			
<i>Apium inundatum</i>				II							
<i>Potamogeton natans</i>		IV	III	III	III	IV*		II		II	II
<i>Glyceria fluitans</i>			III	II				II	II		
<i>Potamogeton gramineus</i>				III	III			II			
<i>Fontinalis antipyretica</i>			III	II	II			II		II	
<i>Potamogeton perfoliatus</i>			II	IV	III			II			
<i>Potamogeton obtusifolius</i>					III						
<i>Potamogeton berchtoldii</i>				II	IV			II			II
<i>Callitriche stagnalis</i>			II	II				II	IV	II	
<i>Elodea canadensis</i>					IV*				II	II	III
<i>Nuphar lutea</i>					II				III	V*	
<i>Lemna minor</i>									IV	III	II
<i>Lemna trisulca</i>										III	
<i>Elodea nuttallii</i>											II
<i>Sparganium emersum</i>											II
<i>Polygonum amphibium</i>					II			II	IV	II	III
<i>Zannichellia palustris</i>								II	III		
<i>Enteromorpha</i> spp.							II				
<i>Myriophyllum spicatum</i>				II				III			III
<i>Potamogeton crispus</i>					II			II			II
<i>Potamogeton pectinatus</i>				II			IV*	III			III
<i>Potamogeton pusillus</i>				II	II			II			III
<i>Callitriche hermaphroditica</i>				II	II			II			
<i>Chara</i> spp.				III	III*			III		II	III
<i>Fucoids</i>							III				
<i>Ranunculus baudotii</i>				II				III			
<i>Ruppia</i> spp.							IV*				
<i>Hippuris vulgaris</i>				II				IV		II	
<i>Potamogeton filiformis</i>				III				III			
No. of sites in group	48	192	322	72	52	34	15	127	70	28	158
Av. No. of spp per site (submerged & floating)	3	7	9	10	13	4	3	8	7	7	8
Av. No. of spp. per site (submerged, floating & emergent)	7	14	17	19	24	11	6	16	24	19	19

Constancy classes

V = 80+ to 100%

IV = 60+ to 80%

III = 40+ to 60%

II = 20+ to 40%

* = cover value high (frequent to abundant)

'Species' numbers include bryophytes and algae determined to genus only.

Ultra-oligotrophic, high altitude lakes, containing only bryophytes, are not included.

APPENDIX 5

“A scoring system for the selection of sites with assemblages of amphibians” Table 29, p268 – *Guidelines for selection of biological SSSIs* (1989), Nature Conservancy Council.

		Low population	Good population	Exceptional population
Smooth newt	Netted in day Counted at night	<10	10-100	>100
Palmate newt	Netted in day Counted at night	<10	10-100	>100
Common toad	Estimated Counted	<500 <100	500-5000 100-1000	>5000 >1000
Common frog	Spawn clumps counted	<50	50-500	>500

Great crested newt has been omitted from the table as they are dealt with under separate guidelines.

Scores have to 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.

APPENDIX 6

Breeding Bird Assemblages

- 1) Based on English Nature's SSSI Selection Criteria
- 2) Northumberland non-breeding species removed from the lists
- 3) Threshold Site Index values adjusted to match the new list, a site must score greater than or equivalent to the threshold value in order to be designated
- 4) Index values have been adjusted according to a regional context and using *Birds of Conservation Concern* as a guide. Values may need to be adjusted slightly based on field testing
- 5) Mosaic habitats should be assessed against the habitat that is most important to breeding bird assemblages, i.e. highest species diversity and birds of conservation concern

Lowland Damp Grassland

Teal	3	Snipe	3
Shoveler	4	Short-eared owl	3
Redshank	2	Yellow wagtail	3
Ruff	5	Grasshopper warbler	3
Lapwing	2	Sedge warbler	1
Curlew	2	Reed bunting	1

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **14**

Lowland Fen (Where this habitat occurs in combination with open water, use the open water list instead)

Bittern	5	Grasshopper warbler	3
Shoveler	4	Sedge warbler	1
Teal	3	Reed warbler	2
Water rail	3	Bearded tit	5
Snipe	3	Reed Bunting	1
Cuckoo	2		

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **14**

Lowland Open Waters and their Margins

Little grebe	2	Water rail	3
Great crested grebe	3	Oystercatcher	1
Black-necked grebe	5	Ringed plover	3
Bittern	5	Little ringed plover	4
Mute swan	2	Redshank	2
Shelduck	2	Lapwing	2
Gadwall	3	Snipe	3
Shoveler	4	Common tern	3
Teal	3	Yellow wagtail	3
Garganey	5	Grasshopper warbler	3
Pochard	4	Sedge warbler	1
Tufted duck	3	Reed warbler	2
Red breasted merganser	4	Bearded tit	5
Marsh Harrier	5	Reed bunting	1

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **28**

Upland Waters and their Margins

Little grebe	2	Red breasted merganser	4
Black-necked grebe	5	Dunlin	4
Great crested grebe	3	Common sandpiper	2
Wigeon	4	Redshank	2
Shoveler	4	Lapwing	2
Teal	3	Curlew	2
Tufted duck	3	Snipe	3

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **14**

Upland Moorland and Grassland with Water-bodies (small ponds)

Wigeon	4	Common sandpiper	2
Teal	3	Redshank	2
Red breasted merganser	4	Golden plover	3
Hen harrier	5	Lapwing	2
Buzzard	2	Curlew	2
Golden eagle	5	Snipe	3
Merlin	4	Short-eared owl	3
Peregrine	5	Whinchat	3
Cuckoo	2	Wheatear	1
Black grouse	5	Ring ouzel	3
Red grouse	1	Raven	4
Dunlin	4	Twite	5

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **25**

Upland Moorland and Grassland without Water-bodies

Hen harrier	5	Curlew	2
Buzzard	2	Snipe	3
Golden eagle	5	Short-eared owl	3
Merlin	4	Skylark	1
Peregrine	5	Whinchat	3
Cuckoo	2	Stonechat	2
Black Grouse	5	Wheatear	1
Red grouse	1	Ring ouzel	3
Redshank	2	Raven	4
Golden plover	3	Twite	5

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **25**

Scrub (new plantation is not included)

Grey partridge	2	Whinchat	3
Cuckoo	2	Stonechat	2
Long-eared owl	3	Song thrush	2
Nightjar	4	Mistle thrush	2
Tree pipit	2	Grasshopper warbler	3

Willow warbler	1	Tree sparrow	3
Whitethroat	2	Bullfinch	2
Lesser whitethroat	3	Linnet	2
Blackcap	1	Corn bunting	2
Garden warbler	1	Yellowhammer	2

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **12**

Woodland

Grey heron	3	Mistle thrush	2
Goshawk	5	Wood warbler	3
Honey buzzard	5	Chiffchaff	1
Buzzard	2	Willow warbler	1
Hobby	5	Blackcap	1
Kestrel	2	Garden warbler	1
Black grouse	5	Goldcrest	1
Woodcock	2	Spotted flycatcher	2
Stock dove	1	Pied flycatcher	2
Cuckoo	2	Long-tailed tit	1
Tawny owl	2	Marsh tit	2
Long-eared owl	3	Willow tit	2
Nightjar	4	Coal tit	1
Green woodpecker	2	Treecreeper	1
Lesser spotted woodpecker	5	Nuthatch	2
Great spotted woodpecker	1	Jay	1
Tree pipit	2	Hawfinch	5
Redstart	2	Siskin	2
Fieldfare	5	Bullfinch	2
Song thrush	2	Redpoll	1
Redwing	5	Common crossbill	3

NORTHUMBERLAND THRESHOLD SITE-INDEX VALUE: **30**