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Sites of Importance for Nature Conservation in North Yorkshire

(Outside the Yorkshire Dales and North York Moors National Parks boundaries)

Guidelines for Site Selection

Version No.	Status	Update summary	Date of issue
1	Final version, published		August 2002
2.1	Final version, published	Non-technical summary, Part 1, Grassland and Woodland criteria	August 2009
3.0	Draft for approval	Bird criteria, verge qualifier in Gr4, NVC communities used in Gr, Wd, Fe, Sw guidelines <ul style="list-style-type: none">• Gr1: U1c added; CG8 deleted• Wd2: W8g deleted• Fe1: guideline worded amended• Fe2: S25, S26, S27 deleted• Sw3: A13 added	November 2017
3.0	Final version, published		December 2017

North Yorkshire SINC Panel, August 2002. Updated 2009, 2017

Further copies are available from:

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Foreword

North Yorkshire is home to an impressive array of habitats and wildlife, ranging from the uplands of the Pennines to the varied coastlines of the east. This diversity of wildlife is a key indicator of the County's environmental health and a major factor in the quality of life of those who live and work here. It is everyone's responsibility to help maintain it as a viable and thriving natural resource and the starting point for this is the identification of what is most valuable and irreplaceable. North Yorkshire supports internationally important habitats, as well as designated sites of national importance. The basis for these statutory designations is well documented and has stood the test of many challenges.

The immense biodiversity of North Yorkshire is not, however, restricted to these areas. It is also found at a more local level in a myriad of other sites of very high nature conservation interest. Their importance is reflected in the identification of non-statutory 'Sites of Importance for Nature Conservation' (SINCS). This system of designation is established throughout the UK and is an important part of development plan production. SINCS must merit their status and be based on well reasoned, well documented and inclusive systems of identification.

These guidelines are the first attempt in North Yorkshire to produce such a system, agreed by all of the principal organisations concerned with the natural environment. It is the result of over two years work by many organisations and individuals, a full list of whom is provided overleaf. This team has devised a solid basis for SINC designation, based on an up to date survey of the whole county, whilst taking account of the variation in landscape and geology for which North Yorkshire is justly famed.

We commend these guidelines to you in the certainty that their use will help us all to identify the most important elements of our local natural environment, and in turn provide a reasoned basis for their conservation.

The North Yorkshire SINC Steering Group:

**Natural England
Environment Agency
North Yorkshire County Council
Yorkshire Wildlife Trust**

Acknowledgements

The North Yorkshire SINC Steering Group would like to acknowledge the assistance and advice of the North Yorkshire SINC Panel members:

Phyl Abbott	Botanical Society of the British Isles
Alison Fraser	Baker Shepherd Gillespie
Martin Fuller	Environment Agency
Martin Hammond	Ryedale District Council & Independent Consultant
Lisa Kerslake	North & East Yorkshire Ecological Data Centre
Kirsty Maddocks	North Yorkshire County Council
Robert Masheder	Yorkshire Wildlife Trust
Deborah Millward	Botanical Society of the British Isles
Bob Missin	Scarborough District Council
Julian Rudd	Ryedale District Council
Peter Shepherd	Baker Shepherd Gillespie
Andrew Weston	Independent Consultant
Geoffrey Wilmore	Botanical Society of the British Isles
Richard Wilson	English Nature (Leyburn)
Sarah Woolven	English Nature (York)

The Steering Group would also like to thank David Clayden and Helen Smith (English Nature), Margaret Atherden (Yorkshire Naturalists' Union), Ian Johnson (Scarborough Borough Council), John Edwards (North Yorkshire County Council), Derek McKenzie (formerly Hambleton District Council), Paul Burgess (Harrogate Borough Council), John Deakin (formerly Selby District Council), Sally Cawthorne (Selby District Council) and Richard Archer (RSPB) for the additional advice and support they have provided.

Thanks are also due for the advice and information provided by other counties who either currently have or are developing selection criteria for non-statutory Sites of Importance for Nature Conservation. The key sources of assistance to the SINC Panel are the guidelines of Derbyshire, Gloucestershire, Lancashire, Nottinghamshire, Northumberland and West Yorkshire.

The draft report was prepared under contract to North Yorkshire County Council by Dr Peter Shepherd of Baker Shepherd Gillespie.

Non-Technical Summary

This report provides guidelines for the evaluation and designation of non-statutory sites of importance for nature conservation in North Yorkshire. It also explains why the designation of non-statutory sites is required and describes how this has been undertaken.

In England there are various site designations giving statutory protection for their national or international importance for nature conservation. These sites include Special Protection Areas (SPA), Wetlands of International Importance (Ramsar Sites), Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR). Local Nature Reserves (LNR) are statutory designations for sites of significant local value for nature conservation, education and local community.

Non-statutory sites of nature conservation value, unlike national and other statutory designations, are identified within the local context. These guidelines cover the seven districts within the county of North Yorkshire and the City of York (referred to as North Yorkshire from here onwards), but National Parks (the North York Moors and Yorkshire Dales) are not included. The selection of non-statutory sites in North Yorkshire is based on agreed criteria and standards that reflect the extent, variation and quality of the nature conservation resource in the county. The guidelines have been based on the best currently available data on habitats and species within North Yorkshire.

Site of Importance for Nature Conservation (with the acronym 'SINC') is the term given to a non-statutory site in North Yorkshire. A SINC is designated on the basis of its ecological interest. SINC designation aims to identify and protect the most important nature conservation sites and features. SINC survey and designation also provides opportunities to contact SINC owners to offer help, advice and practical assistance with the management of these valuable sites. North Yorkshire supports a wide range of habitats and species including priorities in the UK Biodiversity Action Plan (HM Government, 1994). SINC designation and positive management makes a valuable contribution to the implementation of the local BAP objectives and targets within the county.

The designation of SINC is in line with UK Government policies and guidance, much of which comes from the UK's commitment to international conventions and agreements on the environment, biological diversity and sustainable development.

In 1992 the UK Government signed the Convention on Biological Diversity (Biodiversity) thereby undertaking to ensure human activities do not lead to long term declines in biodiversity. The UK Government is also committed to the concept of sustainable development. In 2005, the UK Government prepared *Planning Policy Statement 9 Biodiversity and Geological Conservation* and several associated documents in which the role, protection and value of locally based site designations was identified. The commitments made by the UK Government to sustainable development and the conservation of biodiversity are reflected in a wide range of Government policies and guidance on planning, which is the principal mechanism through which non-statutory sites are protected.

The North Yorkshire SINC Panel was established in 1998. The Panel arose as part of a major re-survey programme of key valuable habitats and sites that took place between 1998-2000 across the county of North Yorkshire led by the North Yorkshire SINC Steering Group. The survey of potential SINC and monitoring of existing SINC form part of a rolling programme of surveys undertaken each year. The Panel comprises representation from local authorities within the county, Natural England, Yorkshire Wildlife Trust, vice-county recorders of the Botanical Society of the British Isles, the North & East Yorkshire Ecological Data Centre (NEYEDC), local independent consultant ecologists and academic institutions. Other organisations and individuals including the Environment Agency provide advice and information as and when required.

The remit of the SINC Panel is to identify and assess sites of potential SINC status within North Yorkshire. The Panel also maintains high quality standards to ensure that SINC sites in North Yorkshire are of substantive nature conservation value, and has a review role, when necessary, in the light of new biodiversity knowledge or research. The Panel works with the SINC Steering Group to assist the delivery of site management action and monitoring of SINC sites.

The guidelines for the selection of SINC sites are based on habitat and species characteristics and include the implementation and review processes.

Habitat Guidelines

Habitat guidelines are presented for ten broad habitat types. These are:

Grassland – six guidelines are provided covering lowland and upland neutral, calcareous and acid grassland (Gr1–Gr6)

Woodland, scrub and hedgerows; – nine guidelines are provided, six of which cover woodlands (Wd1–Wd6). Two guidelines for species rich hedgerows and hedgerows acting as corridors (Wd7–Wd8) and the final guideline is for the selection of valuable scrub communities (Wd9).

Parkland, wood pasture & scattered trees – two guidelines are presented which guide the selection of good examples of parkland (Pk1) and important groupings of veteran trees (Pk2).

Fens, lowland mires, springs & flushes – seven guidelines are presented for the selection of rare community types (Fe1), extensive stands of fen dominated by specific community types (Fe2), good examples of species-rich and species-poor fens and acid mires (Fe3 and 4), good examples of mixed fen and mire habitats (Fe5) and groupings of important springs and flushes (Fe6 and Fe7).

Standing water – four guidelines are presented to cover nutrient rich through to nutrient poor water bodies and rare aquatic habitats (Sw1–Sw4)

Flowing water – three guidelines are provided covering the selection of natural rivers and streams and rare flowing water habitats (Fw1-Fw3).

Coastal habitats – two guidelines are presented, which cover the selection of semi-natural habitats of coastal cliff slopes and the estuarine habitats of the River Esk (Co1 and Co2)

Upland moorland habitats – one guideline is presented for this habitat that includes the selection of large areas of good quality moorland habitat (Mo1).

Habitats on artificial substrates – three guidelines are presented to cover habitats that lie on artificial substrates, including metalliferous communities on lead mining waste (Ar1), cinder bed communities (Ar2) and habitats that develop on pulverised fuel ash (Ar3).

Mixed habitat & structural mosaics – three guidelines are presented aimed at the selection of mixtures of different habitats that individually do not meet other habitat guidelines, but collectively support a high diversity of species and habitats (Mh1-Mh3).

In each set of guidelines, in order to give the user a basic overview of each habitat, information is presented about the habitat in the UK and North Yorkshire context. For each guideline an explanation is provided of how it is to be applied and the rationale behind the guideline is also explained.

Species Guidelines

The species guidelines cover the following biotic groups:

Vascular plants (VP1–VP4);

Non-vascular plants including lichens (L1 – L5), mosses and liverworts (ML1 – ML4), stoneworts, (S1), fungi (Fu1 – Fu3);

Mammals (M1 – M4);

Birds (B1 – B7);

Reptiles (R1 and R2) and Amphibians (A1-A3);

Fish (F1 and F2); and

Invertebrates including Butterflies and Moths (BM1 and BM2), Dragonflies and Damselflies (DD1 – DD3), wasps, ants and bees (H1 – H4), other invertebrates (I1 and I2).

For all groups the guidelines cover differing degrees of rarity, from internationally important species to county rare species. Other guidelines cover assemblages of species where there is sufficient survey data to develop reliable selection thresholds.

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PART ONE:

Introduction

1.1 Background

The first widespread habitat surveys in North Yorkshire were undertaken on a district by district level between 1988 and 1993. During which time each of the seven districts (outside the National Parks), was covered by a Phase 1 habitat survey. Two of the districts, Richmondshire and Craven, were surveyed specifically for their grassland and/or woodland resource rather than a complete Phase 1 habitat survey of the geographical area. The survey results were subsequently used at a district level to identify a series of non-statutory nature conservation sites. Site selection was a collaboration between the relevant District Council, English Nature (now Natural England), Yorkshire Wildlife Trust and North Yorkshire County Council. In most cases there were few written details of site selection criteria used. The sites were identified within the relevant Local Development Plan and policies devised for their protection within the planning system.

Local government re-organisation in 1996 led to the City of York Council and the two National Parks becoming unitary authorities; however, reference to North Yorkshire in these Guidelines includes the administrative areas covered by the City of York Council and North Yorkshire County Council. At the current time SINC systems do not exist within the two National Parks, so these guidelines do not cover the National Parks.

From 1997 onwards North Yorkshire County Council has employed its own ecologists with funding and support from Natural England, the Yorkshire Wildlife Trust, the Environment Agency, Forestry Commission and the District Councils. Collectively, these organisations formed the North Yorkshire SINC Steering Group. This partnership initiated, led and coordinated the delivery of several major projects within the first three year period. The most significant of these are:

- a re-survey programme of the county's non-statutory nature conservation sites known as the *North Yorkshire SINC's and Key Habitats Survey*; and
- the preparation of written objective and scientific criteria for their selection across the county known as *Sites of Importance for Nature Conservation in North Yorkshire - Guidelines for SINC Selection* (August 2002, as amended).

In 1998 the SINC Steering Group formed a subgroup, namely North Yorkshire SINC Panel, to lead and take forward the preparation of the 'Sites of Importance for Nature Conservation in North Yorkshire - Guidelines for Site Selection' (referred to as the SINC Guidelines from here onwards). The SINC Panel has met on a regular basis ever since to undertake site assessment and to maintain and update the selection guidelines as appropriate and necessary.

North Yorkshire SINC's and Key Habitats Survey

Surveys were undertaken between 1998-2000 inclusive and included non-statutory sites shown in the Local Plans and other selected sites of potential nature conservation interest. These included selected ancient woodlands, Phase 1 habitat survey target notes and sites identified by the partner organisations. This was a significant undertaking, resulting in nearly 1000 sites being surveyed in total.

From 2001 onwards, the North Yorkshire SINC Steering Group has maintained a regular annual rolling survey programme, at approximately 50 sites per annum, to encompass:

-
- sites requiring further survey data or additional boundary information following initial assessment by the North Yorkshire SINC Panel;
 - sites of potential biodiversity value not previously formally surveyed or assessed;
 - sites known to have biodiversity value but have no formal recognition and which require survey and evaluation against the selection guidelines as matter of priority to inform a potential development plan, project or proposal;
 - existing SINC sites that may be subject to challenge due to a perceived deterioration in quality that require re-survey and re-evaluation to address potential matters of concern; and
 - monitoring surveys of a proportion of existing SINC sites representing a range of habitat types, conditions and geographical spread across the county.

The SINC Steering Group maintains overall coordination and management of the survey programme and ensures that the resulting information is made available to relevant District Councils to inform the Local Development Framework and development control processes.

Data from site surveys is held and maintained by, the North & East Yorkshire Ecological Data Centre based in York using a combination of a Recorder database and MapInfo Geographical Information System (GIS).

Sites of Importance for Nature Conservation in North Yorkshire - Guidelines for SINC Selection

Since the production of these guidelines in 2002, the knowledge base is continually developing for the SINC system. This includes the use and application of the data and as a result, the SINC Panel undertakes a review and update process. In 2006 amendments were made to the habitat guidelines. The 2008 updates and expand the contents of Part 1 to:

- incorporate recent Government planning policy guidance changes from Planning Policy Guidance Note 9 Nature Conservation, DoE, 1994 to Planning Policy Statement 9 (PPS9) Biodiversity and Geological Conservation, ODPM, 2005;
- make appropriate reference to and seek guidance from the Defra publication *Local Sites – Guidance on their Identification, Selection and Management* 2006;
- accommodate the implications of new legislation with particular reference to the general biodiversity duty conferred upon all public bodies in Sections 40 and 41 of the Natural Environment and Rural Communities (NERC) Act 2006;
- address the needs of the emerging local development documents associated with the Local Development Framework process;
- contribute towards enabling local authorities to implement the national performance indicator NI 197 regarding positive conservation management of Local Sites;
- review the geographic boundaries of the guidelines to encompass neighbouring City of York administrative area, in order to share the combined expertise and effort within the North Yorkshire and City of York;
- update the data context of the guidelines as a result of the establishment of North & East Yorkshire Ecological Data Centre (NEYEDC) and the resulting benefits that continue to ensue for the SINC system; and
- incorporate amendments to the day to day operation of the SINC system based upon the ten years experience of the SINC Panel and its members.

1.2 Sites of Importance for Nature Conservation

1.2.1 Site designations

In England there are a variety of different site designations that impart statutory protection for their national or international importance for nature conservation. These sites are the most important in North Yorkshire and the UK and have been designated under national legislation, European Community Directives and International Conventions. They include Ramsar Sites, Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest and National Nature Reserves (Table 1).

Table 1. International and National Designations

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

Local Nature Reserves (LNR) also receive statutory protection, but are usually of local or regional importance.

Non-statutory sites of county nature conservation value, unlike national and other statutory designations, are identified within the county context.

1.2.2 Sites of Importance for Nature Conservation in North Yorkshire

Site of Importance for Nature Conservation (with the acronym 'SINC') is the term given to a non-statutory site in North Yorkshire. It is increasingly being recognised by planning authorities and Natural England.

The name indicates that the designation is "**site**" based, that these sites are "**important**" in the context of the area within which the designation is made and that the designation is based on "**nature conservation**" features which encompass, ecological, geological and social/cultural values.

Most counties in the UK now operate non-statutory site designation systems and guidelines for the selection of sites are increasingly being published and made available to planning authorities, business and the general public. The Defra publication Local Sites Guidance on their Identification, Selection and Management (Defra, 2006) recommends use of the term Local Wildlife Site or Local Geological Site (where applicable). Although SINC is the formal title for non-statutory sites in North Yorkshire, retained to prevent confusion, the SINC Panel has acknowledged that Local Wildlife Site can be a useful term when dealing with the wider public. In addition other terms such as Sites of Nature Conservation Importance (SNCI), Biological Heritage Sites (BHS) and Locally Important Nature Conservation Sites (LINCS) are also used across the country.

Sites of Importance for Nature Conservation in North Yorkshire are designated on the basis of their ecological interest. The definition of an ecological SINC is given below.

*Ecological SINC*s are the major/most important reservoirs outside the statutory designation system of rare, local and declining native species, habitats and communities and include the best examples of typical North Yorkshire habitat types.

1.2.3 The role of SINCs in North Yorkshire

In North Yorkshire SINC designation fulfils a number of different roles, which are listed below. These roles are not set in any order of priority, but all comprise important functions of the SINC system, as follows:

- SINC designation enables the most important nature conservation sites in the county outside the statutory site designation systems to be identified and protected. In contrast to statutory site systems, SINC
- SINC
- SINC
- the SINC survey and designation process identifies management requirements for each site. Coupled with positive engagement with landowners, this enables local authorities to offer management advice and identify sources of financial support. This in turn contributes to the implementation of the national performance indicator NI197 Local Sites regarding positive management;
- SINC designation is a valuable tool contributing to the delivery of local and countrywide conservation strategies, the UK and relevant local Biodiversity Action Plans, Local Area Agreement targets and environmental sustainability;
- SINC designation and management contributes to the implementation of local Biodiversity Action Plan objectives and targets and locally represented UK priority habitats and species identified in Section 41 of the NERC Act 2006;
- SINC
- SINC
- ecological surveys undertaken to identify and monitor SINC
- the process of site evaluation, in preparation for SINC designation, can help to identify gaps in knowledge about the conservation resource of an area or individual sites that can in turn inform further survey, management, research or monitoring.

1.2.4 SINCs and the Planning System

This section outlines some of the key Government legislation, policy and guidance in relation to non-statutory sites of nature conservation importance, see Table 2.

Much of current government policy and guidance is strongly influenced by the UK's commitments to international conventions and agreements on the environment, biological diversity and sustainable development. The emergence of the climate change agenda has highlighted the importance of safeguarding and appropriately managing biodiversity interests. It also emphasises the importance of biodiversity within sustainability, and specifically with regard to the economic benefits of biodiversity.

The publication of Planning Policy Statement 9 Biodiversity and Geological Conservation¹ in 2005 indicated the government's approach to the protection of biodiversity and geological conservation through the planning system. PPS9 recognises that Local Sites [SINCs] have a fundamental role to play in helping to meet overall national biodiversity targets, contributing to the quality of life and well-being of the community, and in supporting research and education. The significant elements of PPS9 with respect to SINCs are outlined in Table 2.

Table 2: Relevance of Legislation and Planning Policy Framework to SINCs in North Yorkshire

Legislation/Policy/ Guidance Title, Date and Level	Articles/Sections of Particular Relevance to SINCs	Relevance to North Yorkshire SINC system
Planning Policy Statement 9 (PPS9), ODPM August 2005 (National)	Paragraph 1 (i)	SINC related development plan policies and planning decisions in North Yorkshire should be based upon an up-to-date information base for North Yorkshire, including all the districts and City of York, assisted by the ongoing rolling programme of SINC survey and evaluation
PPS9	Paragraph 1 (ii)	The SINC system has a role in the incorporation of the principles to maintain, enhance, restore or add to biodiversity interests in North Yorkshire and City of York
PPS9	Paragraph 1 (iii)	SINCs help enable a strategic approach to be taken for biodiversity conservation in relation to development through working with local planning authorities to identify SINCs on Local Development Framework Proposals Maps and to assist the recognition of green corridors network
PPS9	Paragraphs 1 (vi) and 9	The SINC Guidelines enable the use of the staged judgement process that will be used by Local Development Framework criteria-based policies, by providing an objective and scientific approach, to prevent harm to biodiversity interests of North Yorkshire i.e. avoid harm, mitigate if harm unavoidable, compensate if harm cannot be avoided or adequately mitigated and if none of these can be met then planning permission should be refused
PPS9	Paragraph 5 (i)	The North Yorkshire SINC system is consistent with the requirement in PPS9 that the distinction between the designated site hierarchy is clear
Legislation/Policy/ Guidance Title, Date and Level	Articles/Sections of Particular Relevance to	Relevance to North Yorkshire SINC system

¹ Planning Policy Statement 9: Biodiversity and Geological Conservation ODPM, August 2005.

	Relevance to SINC	
PPS9	Paragraph 9	The SINC Guidelines and Partnership approach in North Yorkshire demonstrate the fundamental role that SINC play in meeting overall national biodiversity targets, contributing to the quality of life and well being of local communities and in supporting research and education
PPS9	Paragraphs 11 and 12	The recognition within the SINC Guidelines of the combined value of site based conservation interests coupled with wider habitats and species interests is valuable to form the basis of a functioning green network from which to expand and re-create areas of and for UK priority habitats and species respectively
Natural Environment and Rural Communities (NERC) Act 2006 (National)	Section 40 (1)	Incorporates a general duty that “ <i>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.</i> ” The term Public Authority includes all local authorities and local planning authorities. This includes SINC and positive management of the biodiversity interests within them.
NERC	Section 40 (3)	There are opportunities within the SINC network for conserving, restoring and enhancing habitats. All of these measures contribute to the implementation of the duty.
NERC	Section 41 (1)	This section refers to the lists of species and habitats that are considered to be of principal importance for biodiversity conservation. Many of these species and habitats can be found within the SINC network.
Working with the grain of nature: a biodiversity strategy for England, Defra 2002.	All	The England Biodiversity Strategy recognises the importance of designated local sites [SINC] and a consistent approach to their operation, in providing important wildlife refuges and stepping stones linking different habitats and helping to maintain biodiversity. The strategy also identifies the key role that SINC play in Local Biodiversity Action Plans and in community strategies.
Conservation (Natural Habitats &c.) Regulations 1994 as amended 2007 (Great Britain)	Regulation 37	This Regulation implements Article 10 of the Council Directive of 21 May 1992 on the Conservation of Natural Habitats and of Wild Flora And Fauna (92/43/EEC) (known as the Habitats Directive) in the UK. The Regulation encourages member states to manage features of the landscape of major importance for wild flora and fauna such as rivers, traditional field boundaries and stepping stone habitats including ponds and small woods. These features can form SINC or be part of SINC. Such sites contribute to the maintenance of wildlife networks in North Yorkshire and provide opportunities to enhance and extend wildlife corridor networks by connecting sites together in the landscape.

Legislation/Policy/ Guidance Title, Date and Level	Articles/Sections of Particular Relevance to SINCs	Relevance to North Yorkshire SINC system
The New Performance Framework for Local Authorities & Local Authority Partnerships: Single Set of National Indicators (DCLG, October 2007). (National)	National Indicator (NI) 197	<p>The indicator is defined as:</p> <p><i>“Proportion of Local Sites [SINCs] where positive conservation management has been, or is being, implemented.”</i></p> <p>NI197 is incorporated into North Yorkshire County Council’s performance framework and will underpin the approach taken to the programme of habitat and species management at SINCs across the county, working with partners and seeking advice and guidance from the North Yorkshire SINC Steering Group and North Yorkshire SINC Panel. The implementation of the indicator will be undertaken using available partnership resources and those secured through any successful grant aid applications.</p>

Following production of PPS9, several subsequent publications have been produced to accompany, support and expand the government’s views and expectations for the delivery of biodiversity, including SINC systems, by public bodies. It is not the intention of these SINC Guidelines to repeat these publications, however, the North Yorkshire SINC Panel uses this information to guide and develop the North Yorkshire SINC system as necessary and relevant to the county. In particular, the Defra publication Local Sites Guidance on their Identification, Selection and Management (Defra, 2006) has assisted the review and implementation of an updated approach by the North Yorkshire SINC Panel. This is reflected throughout these SINC Guidelines. It should be noted that with respect to the Defra Guidance the North Yorkshire SINC Panel has not looked at social criteria for SINCs. It has been left to the individual Local Authorities to determine whether or not they incorporate social criteria.

The Defra Local Sites Guidance indicates (paragraph 10) that the Biodiversity Strategy for England² is the core means of delivery of the NERC Act duty. The relationship between the national Biodiversity Action Plans, UK priority habitat types and the habitat types assessed under these guidelines is broadly outlined in Table 2.1. The SINC network provides a key mechanism for the implementation of BAP objectives and targets.

In North Yorkshire, the approach to the SINC system is to use the best available resources for the identification, safeguard and successful conservation based management of SINCs. This approach is made possible through legislative provision, government guidance, the local partnerships, and the opportunities identified by the North Yorkshire SINC Steering Group and the North Yorkshire SINC Panel. The aim is to deliver a healthy and thriving SINC network supporting priority biodiversity features for their intrinsic wildlife value, providing the ability and opportunity for species and habitats to move and develop over time accordingly.

Table 2.1 Relationship between UK Biodiversity Habitat Action Plans and Key Habitats in North Yorkshire

² Working with the grain of nature: A Biodiversity Strategy for England. Defra 2002.

<i>SINC Panel Habitat Types (including NVC types where known)</i>	<i>Other Important Habitats in North Yorkshire</i>	<i>Internationally Important Habitats in North Yorkshire</i>	<i>UK Key Habitats in North Yorkshire from UK BAP</i>	<i>UK BAP Broad Habitat Type</i>
Wet woodland (W1 - W7) Upland mixed ash woodland? (W9) Upland oakwood (W10, W11, W16, W17) Lowland mixed ash woodlands (calcareous-neutral, W8) Lowland oak/birch rowan woodlands (acid, W10, W16) Scrub (W21-W25) Parkland (MG6, MG7, W10 + more see UK BAP).	Broad-leaved woodland and scrub.	Bluebell woods Upland oakwoods Parkland with Veteran Trees	Wet woodland Upland mixed ash woods Upland oakwood Traditional orchards Lowland mixed deciduous woodland Wood pasture and parkland	Broad-leaved, mixed and yew woodland
Planted coniferous woodland	Planted coniferous woodland (ancient woodland ground flora)			Coniferous woodland
Ancient and/or species rich hedgerows (W8, W10, W21-W25) Dry ditches and banks (see NVC for relevant vegetation types)	Dry ditches and banks Dry stone walls	Ancient and/or species rich hedgerows	Hedgerows	Boundary and linear features
Cereal field margins Arable weed communities (OV1-OV17)	Arable fields and fallow (ruderal/ segetal plant communities)		Arable field margins	Arable and horticultural
Improved grassland (includes species-poor semi-improved grassland) (MG6, MG7, MG9, MG10)			Coastal and floodplain grazing marsh	Improved grassland
Unimproved and semi-improved neutral grassland (species-rich) (MG1, MG3 - MG6)	Road verges	MG3, MG4 flood meadow, MG5 meadows and pastures	Lowland hay meadow. Upland hay meadow. Coastal and floodplain grazing marsh.	Unimproved neutral grassland
Acid grassland U1, U2, U4, U5, U6, U20, M25	Upland dry acid grassland Road verges		Lowland dry acid grassland	Acid grassland
Calcareous grassland (CG2-CG7, CG9 & CG10)	Road verges Disused quarries Railway lines		Lowland calcareous grassland Upland calcareous grassland	Calcareous grassland
Lowland heathland (includes lowland acid grassland mosaics (H9 and M16) Upland heathland (H9, H10, H12, M16)	Lowland acid grassland mosaics	Lowland heathland	Lowland heathland Upland heathland	Dwarf scrub heath

Table 2.1 (cont.) The Relationship between UK Biodiversity Habitat Action Plans and Key Habitats in North Yorkshire

<i>SINC Panel Habitat Types (including NVC types where known)</i>	<i>Other Important Habitats in North Yorkshire</i>	<i>Internationally Important Habitats in North Yorkshire</i>	<i>UK Key Habitats in North Yorkshire from UK BAP (for which a UK HAP prepared)</i>	<i>UK BAP Broad Habitat Type (for which habitat statements have been prepared)</i>
Fen, carr (W1-W6) and reedbed (S1, S3, S4) Wet grassland MG8, MG9-MG11, MG13), marsh and swamp (S5-S10, S12, S14, S15, S17-S23, S25-S28; M1/2 unlikely, M3, M10, M13, M16 M21-M23, M25-M27, M36)	Wet grassland Marsh Swamp Carr Wet ditches and drains	Purple moor-grass meadows	Reedbeds Lowland fens Purple moor-grass and rush pastures Coastal and floodplain grazing marsh. Upland flushes, fens and swamps	Fens, marsh and swamp
Standing water (includes reservoirs) (A2, A5, A7, A8-A13, A14?, A15, A16, A19, A20, A24)	Mesotrophic, Dystrophic, Oligotrophic Charophyte beds Wet ditches and drains	Stonewort beds	Eutrophic standing waters Mesotrophic lakes Aquifer fed naturally fluctuating water bodies Ponds Oligotrophic and dystrophic lakes	Standing open water and canals
Rivers and streams (A2, A5, A8-A12, A15-A18, S14, S22, S23 & S26) sub-heading for chalk streams	Limestone streams	Water crowfoot beds Chalk streams.	Rivers	Rivers and streams
Blanket bog (M3, M19, M20)			Blanket bog Lowland raised bog	Bogs
Maritime cliff and slope (MG1, MG5, MG9, CG6, MC9, MC11, MC8, MC10, W8, W22, W23, W24, W25, W8, M22, H10, U1, U2, U4, M22, A9, S14, S25 and S28)	Flush communities	Maritime cliff and slope	Maritime cliff and slope	Supralittoral rock
Estuaries (SM13 and S21)			Intertidal mudflats Coastal saltmarsh	Littoral sediments
Urban/industrial (communities on unnatural/mixed strata)	Metalliferous sites PFA disposal sites Derelict railways Alum spoil		Calaminarian grasslands Inland rock outcrop and scree habitats Open mosaic habitats on previously developed land	Inland rock

1.3 North Yorkshire Guidelines for SINC selection

The remit of the North Yorkshire SINC Panel is to:

- (a) provide the lead scientific body for the identification and ongoing assessment of sites supporting valuable flora and/or fauna that are of sufficient quality to become SINC within North Yorkshire and City of York boundaries;
- (b) to make recommendations to each district planning authority and City of York Council for the inclusion of a 'SINC Panel approved' list of SINC within each authority's local development documents (to be supported by policy and be identified on the relevant geographic Proposals Map accordingly);
- (c) to maintain high quality standards to ensure that sites given protection in planning policies are of substantive nature conservation interest in the context of North Yorkshire and City of York, to regularly review these standards, according to the developing biodiversity knowledge base, and subsequently publish any amendments to the application of the SINC selection guidelines as necessary; and

- (d) to maintain the system of SINC designation in North Yorkshire and the City of York, working with the SINC Steering Group to assist the delivery of site management action and monitoring of SINCs.

The Panel membership comprises representatives from the organisations, public bodies, naturalists' societies, independent consultants, amateur naturalists and voluntary sector shown in Table 3. The membership of the Panel adapts and expands in order to encompass the relevant expertise required for the matters under discussion, research and development as appropriate. In some circumstances, the SINC Panel forms working groups or subgroups for a defined period of time comprising representatives from the core membership of the Panel plus a suite of other individuals, local experts and organisations. These working/subgroups convene for subject specific work such as and update or revision of the guidelines for a particular habitat or faunal group, for example birds.

Table 3: Membership of North Yorkshire SINC Panel

Type of organisation	Members
Public bodies	Natural England, North Yorkshire County Council, City of York Council, Harrogate Borough Council
Voluntary sector	Yorkshire Wildlife Trust
Local Record Centre	North & East Yorkshire Ecological Data Centre
Consultancy/local surveyors	Martin Hammond, Deborah Millward, Geoffrey Wilmore, Phyl Abbott
Naturalist societies	Vice county recorders for Botanical Society of the British Isles, Yorkshire Naturalists' Union
Academic institutions	University of York & Ripon St John
Other advisors and experts as temporary members on topic specific basis	Environment Agency, District Councils of North Yorkshire, Yorkshire Dales National Park, British Trust for Ornithology

1.3.1 Format of the Guidelines

The guidelines for the selection of ecological SINCs are divided into two parts. The selection of SINCs based on habitat characteristics and the selection based on characteristics of species groups.

For each habitat the guidelines describe the status of the habitat in the International, National, Natural Area and North Yorkshire context, and set out the criteria and attributes on which the designation of a SINC is based. For each species group, details of the legal protection/status afforded are provided where applicable. There are currently no descriptions of each species group in the North Yorkshire context, as this information is not available for all species groups. Information on well-recorded groups can be found through direct contact with local recorders. Specific guidelines are subsequently provided which establish the selection thresholds on which a SINC is designated and set out the rationale for each guideline and how it should be applied.

1.3.2 The basis of the Habitat Guidelines

The guidelines are based on a process that utilises evaluation criteria. These criteria are based on measurable site attributes and assessment of the quality of a site is judged against selection thresholds for the attributes.

For example, under the criterion of rarity the selection guideline may indicate that a particular habitat type is so rare that any example of that type may qualify as a SINC. However, to ensure that the site is an example of the habitat that warrants protection, it may need to be greater than a certain size. Size is a selection criterion, the area of the site a measurable attribute and the

minimum area requirement is a selection threshold. The relationship between criteria, attributes and thresholds is illustrated in Table 3.1

This approach to SINC selection recognises that all attributes are of equal importance regardless of the detail or extent of knowledge about the attributes within North Yorkshire, although some attributes on their own may not be sufficient to warrant designation. For example, the size (area) of a site may be used to set a minimum threshold for selection so long as the quality of the habitat comprising the site meets the selection thresholds for other site attributes. The thresholds used for selection can be adjusted as the nature conservation resource changes or as the knowledge about habitats and species of importance increases. The on-going monitoring of the guidelines and their application is part of the role of the SINC Panel.

Table 3.1 Possible relationships between selection criteria, attributes and thresholds.

Criterion	Attribute	Threshold
Size	Area or population size	Minimum area or minimum number of breeding pairs etc.
Naturalness	Habitat features indicate the habitat is long established or has natural characteristics.	Sites on Ancient Woodland Inventory. Rivers with a dynamic range of natural features and a high water quality.
Representativeness	Habitat features and species assemblages that represent the combination of biotic and abiotic factors influencing the site.	Any sites that support more than the minimum threshold of species characteristic of the habitat type.
Rarity	Species rarity. Habitat and/or vegetation community rarity.	All sites that support populations of nationally scarce or Red Data Book Species. All examples of county rare habitats e.g. MG3 upland hay meadow.
Diversity	Diversity of species in total or diversity of species from particular biotic groups. Diversity of habitat and vegetation structure.	Any sites that support more than the minimum threshold of a list of species.
Position within an ecological /geographical unit	The site is within a wildlife corridor or part of a collection of sites within a particular geographical location.	The site is within a threshold distance from another site of the same habitat type. The site is connected via an ecological corridor or linear habitat.

The selection criteria for SINC used by the SINC Panel to develop these selection guidelines have been based on the ten 'Ratcliffe Criteria' used in *A Nature Conservation Review*³. These criteria have been widely used for the assessment of nature conservation value for sites ranging from National Nature Reserves to the ecological interest of development sites and other non-designated land. Not all of the ten criteria have been used and the guidelines are primarily based on Rarity, Diversity, Size, Naturalness, Representativeness and Position in an ecological/geographical unit. Recorded History and Fragility have also been used, but only for one or two of the habitat types. Not all of these criteria are useful in the selection of SINC all of the time because for some habitats or species groups criteria such as naturalness or position in an ecological/geographical unit cannot be satisfactorily defined or measured. The most frequently used and therefore key criteria are Rarity, Diversity, Size and Representativeness.

Size

³ Ratcliffe, D.A. (1977). *A Nature Conservation Review Volume 1*. Cambridge University Press.

This criterion can be applied in different ways. For habitats it does not act as a single selection criterion because it is used to set minimum thresholds for habitats that also have to be of a particular quality in order to be eligible for SINC selection. In relation to the guidelines for species groups size is used to set a selection threshold for populations of particular species.

Rarity

This is an important criterion that reflects one of the primary aims of nature conservation, namely, the prevention of the further loss of species from their natural range. Rarity is also a valuable criterion because it can be measured more readily than some other criteria. For example, standards are set for the classification of species as rare or scarce at a national, local or county level. Rarity is not just applicable to species, but also habitats, geological and geomorphological features and assemblages of species. Rarity can be broadened to include those habitats and species that are rare, threatened or in decline over a wider geographic area, such as continental Europe, for which the UK has a particular responsibility (e.g. great crested newt, Natterer's bat and lowland heathland). *The Biodiversity Audit of Yorkshire and the Humber*⁴ lists rare and declining habitats and species within the region. These lists have been used to inform the preparation of the habitat and species selection guidelines for North Yorkshire.

Diversity

This criterion can be applied to a range of characteristics of a site, but is most often measured in terms of diversity of species, habitats and vegetation communities, which in turn, reflect the physical characteristics of a site such as diversity of soil types, hydrology, micro-climate and topography. The criterion is utilised in the guidelines through the choice of selection thresholds that have been set for habitats and species. For habitats the selection thresholds for the number of characteristic species of a habitat type usually will reflect the species diversity of a site. For species groups diversity is reflected in the selection thresholds set for good species assemblages.

Representativeness

This criterion can be difficult to apply and unless clearly defined can lead to a degree of confusion during site evaluation and SINC selection. It is, however, an important criterion because it reflects the desire to ensure that the full characteristic variety of the natural environment of North Yorkshire is maintained, not just the rare or particularly species diverse. Consequently, the criterion should enable the selection of habitats and species assemblages representative of the habitats and species groups over a wider geographical area, as well as, those that are locally distinctive in the North Yorkshire context.

The criterion is used in both the habitat and species guidelines, through the selection thresholds for the lists of characteristic species of each habitat type and the selection thresholds for characteristic assemblages within each species group.

Naturalness

This criterion, like representativeness, can be difficult to apply because it can be utilised in a variety of different ways. However, in these guidelines it is primarily used in habitat selection guidelines to reflect the longevity of the habitat. For example, sites listed on the Ancient Woodland Inventory for North Yorkshire are highly valued because of their long or continuous history of woodland cover. Assemblages of species, or the presence of particular species that are strongly associated with long established habitats, have also been used to guide the selection of SINC's.

Position in an ecological geographical unit

This is one of the hardest criteria to apply to site selection. It is important however, in terms of our understanding of the adverse impact of habitat fragmentation on species populations. It is now

⁴ Selman, R., Dodd, F and K. Bayes (1999). *A Biodiversity Audit of Yorkshire and The Humber*. Yorkshire and Humber Biodiversity Forum.

recognised that it is important to maintain inter-linked habitat mosaics to reduce the effects of fragmentation and isolation (e.g. Article 10 of the EC Habitats Directive).

It is often not possible, to quantify the significance of the inter-relationships between different blocks of habitat in maintaining species populations. Consequently, this criterion has been used in the guidelines to encourage the protection of groupings of sites even when some of the sites within the grouping may fall just short of the selection thresholds.

1.3.3 The basis of the Species Guidelines

The species guidelines for the selection of SINC in North Yorkshire have been based on the use of 5 selection criteria. The principal criteria used have been Rarity, Diversity and Representativeness. Naturalness and Size have only been used for specific circumstances. Examples of how the criteria have been reflected in the guidelines are shown in Table 4.

Table 4: Examples of how the Selection Criteria have been used in Developing Selection Guidelines

Criterion	Attribute
Size	The size of the population of a species has been used in some selection guidelines. For example the number of individuals and species of amphibian present at a site has been used to assess the significance of a population.
Representativeness	This criterion is reflected in some of the guidelines where a significant assemblage of species has been used to identify typical examples of particular species groups for particular habitats. E.g. the guideline for assemblages of breeding birds for particular habitats.
Diversity	This criterion is reflected in some of the guidelines where assemblages of species have been used to identify good, diverse populations of species belonging to a particular species group or plant community.
Rarity	Presence of nationally rare, nationally scarce and county rare species has been widely used in the selection guidelines. The priority status of species within the NERC Act 2006 lists is also used to reflect the identification of important species in North Yorkshire that are significant in the UK context.
Naturalness	This criterion is not widely used, however one example of its use is with the Index of Ecological Continuity for identifying important lichen assemblages reflects the naturalness of sites and for flowing water, the presence of features associated with natural rivers.

Rarity is generally represented at different hierarchical levels. These different levels impart greater degrees of importance to the species. This can depend, however, on the level at which rarity is measured, as some species that are rare at the national or international level can be relatively frequent at the county level if North Yorkshire is a stronghold for the species. An example of this is spring sandwort *Minuartia verna*, which is a nationally scarce plant, but is relatively frequent in North Yorkshire where it is associated with lead mine wastes. In these circumstances, the management of the species at a local level takes on greater responsibility for the UK as a whole.

The different levels of rarity identified in the guidelines refer to:

- *Species that are of international importance.* These species are identified in European Community Directives (Habitats and Birds Directives).
- *Species that are of national importance.* The NERC Act 2006 priority species list is consulted to identify species that are nationally rare. It is acknowledged by the SINC Panel that these lists also reflect threat and/or decline in addition to rarity.
- *Species that are of local importance.* Formal consultation is undertaken with recognised experts and/or specialist skills sought from the Botanical Society of the British Isles, the Yorkshire Naturalists Union and NEYEDC with regard to the determination of the relevant level of rarity and status for a given species population for species that are identified as rare in North Yorkshire. This provides the ability to ensure that the best, most reliable and up to date available records and information are used to assess local rarities due to changing distributions and geographic locations of species. This includes species migration due to changing climatic conditions. Further, care has to be taken when considering rarity of particular species, as rarity can be a feature of the coverage of survey rather than a true reflection of the rarity of the species. The expertise and advice of the afore-mentioned organisations is, therefore, of significant value in order to assess the true rarity of a given species.

Where there is sufficient knowledge of the species group concerned, guidelines have been based on assemblages of species as a measurable attribute. This provides a measure of the diversity of a particular group of species at a particular site, and a way of assessing the representativeness of a particular habitat type.

The use of species assemblages for site selection is most useful for groups where there has been regular and widespread recording. This enables an overview of the importance of a particular site to be determined, as some assemblages of species are characteristic of longstanding habitats. The use of assemblages for some animal groups also allows assessment of habitats that may be inherently poor or uncharacteristic from a plant point of view.

The guidelines for selecting SINC sites are based on a number of common issues that should be applied to the selection of sites.

For the purposes of these guidelines selection is based on species that are:

- (a) native to North Yorkshire;
- (b) native to Britain, but have recently naturally colonised the county; or
- (c) native species that have been introduced through recognised species conservation programmes.

Species that have been, or are believed to have been, deliberately introduced or are casual in the county are not eligible for inclusion.

The guidelines make use of a number of terms throughout including locality, good, significant and regularly. Where terms such as 'good' and 'significant' are used, an explanation of how to determine what constitutes a good or significant site has been provided.

In relation to determining rarity within a county context the term 'locality' refers to an area up to or less than 1 square kilometre. This does not necessarily have to relate to a fixed national grid square and the 1km square can be moveable.

The presence of rare species within SINCs is monitored as part of the ongoing and rolling programme of SINC monitoring within North Yorkshire and any other surveys undertaken by reliable and experienced experts (individuals or organisations) recognised by the SINC Panel.

1.3.4 Limitations imposed by availability of information

It is important that the guidelines are based on information that enables the substantive nature conservation value of sites to be determined and justified. For some species groups there is little or no systematic information for North Yorkshire and it is not possible to develop effective guidelines using these groups as a basis for selection. In time with further study some of these species groups may prove useful in SINC selection and the guidelines will be adapted accordingly. Consequently, the selection guidelines are based upon the current best available information about the extent, quality and distribution of habitats and species in North Yorkshire. The data produced by the SINC surveys themselves is an effective tool in reviewing and adjusting the guidelines for site selection. In particular, adjusting the sensitivity of the thresholds used in the habitat guidelines and the lists of indicator species is informed by increased knowledge of the geographical distribution of habitats and species as a result of the surveying of SINC sites.

Data are more available for some habitats and species groups than others, which is reflected in the selection guidelines. For example, widely studied species groups such as birds feature prominently in the guidelines because the database on birds in North Yorkshire is substantial and being constantly monitored by a network of amateur and professional ornithologists. Species guidelines in particular are reviewed as more information is gathered by the naturalist community. Indeed the bird species guidelines (B1 to B7) are currently under review by a specialist sub group of the SINC Panel as a result of such new information.

More information is being released and shared by other organisations with an interest in the natural environment, particularly by the government organisations. This information is being fed into and informing the review of the SINC guidelines, particularly for those habitats where substantive data was not previously available and is difficult or costly to capture by a small group such as the SINC Panel. For example, data is currently being exchanged with the Environment Agency where their habitat assessment and water quality data is being used as a basis for reviewing the flowing water habitat guidelines.

1.4 Application of the SINC Guidelines

1.4.1 SINC assessment and notification procedure

The SINC Panel is responsible for the identification of sites that are of suitable quality to be designated SINC, following a site by site assessment using the guidelines. A list of SINC confirmed as of substantive nature conservation value are forwarded to the relevant District Council. The SINC Panel advocates that District Councils approve and include the list with their local planning documents, including the Proposals Map, as part of the Local Development Framework production and subsequent review. Ultimately, it is the District Council that decides which sites will be formally identified as SINC. Any changes to SINC, in terms of inclusion or amendment to boundaries, are made available to the District Council to maintain an up to date evidence base across North Yorkshire. Such changes may be identified through the SINC monitoring or survey programme. A District Council may choose to include additional sites that do not qualify under the guidelines. Similarly, a District Council may choose not to ratify sites that do qualify. A close working relationship is envisaged between the District Councils, NEYEDC and the SINC Panel with regard to site selection, protection, information and advice provision.

This approach to SINC selection started across the county using the guidelines for the first time in 2001-2005 following the completion of the North Yorkshire SINC and Key Habitats Survey. Since then, the identification and assessment of SINC is ongoing based upon the regular survey and monitoring programmes.

The survey results for each site are held at NEYEDC. The information is held in the form of a written citation, habitat and boundary map and species list. Information also includes management issues, and other relevant points of significance. Evaluation data is held by NEYEDC and can also be made available on the citation. This identifies the relevant guideline/s under which a site qualifies.

Existing SINC's are re-evaluated using all relevant and available site data. The decision is recorded as a significant component of the SINC programme. This is in order to establish the continued significance of the nature conservation value and to inform potential positive management activities to retain or enhance that interest. As part of the ongoing survey programme, sites that previously had no designation may become SINC's and a number of existing SINC's may no longer qualify and will be removed from the list. It is, therefore, a pre-requisite that consultation is undertaken with NEYEDC in order to establish the most up-to-date information pertaining to SINC status, as this can be subject to change during the period to which the relevant district based local development documents apply.

It is important to note that the purpose of any potential changes to SINC designations is to ensure that the districts maintain an up to date evidence base upon which to base their decisions in the exercise of their planning functions and that SINC's are identified and retained on the basis of the principle of supporting substantive nature conservation interest.

1.4.2 Monitoring and re-survey

Ideally all SINC's will be revisited every 5 to 10 years (in accordance with the Defra Local Sites Guidance) to ensure that the appraisal of sites remains valid and up to date and to assess site condition. Sites will initially receive a monitoring visit, which will note major changes in land use and habitat type and will often be sufficient to confirm the site status and condition. Where major issues are noted the site will receive a full re-survey. Resulting survey and monitoring information will be entered into the SINC data system by NEYEDC.

To ensure that the monitoring and re-survey process does not just identify the decline of the SINC system. It is necessary to take positive action to help landowners and managers take positive management action on their SINC's to enable good condition to be maintained or for condition to improve. This may be through the use of grant aid and advisory services or through practical management tasks, which can be undertaken by local volunteer services.

1.4.3 SINC review procedure

The Panel will consider any new sites put forward for SINC selection, to evaluate them using the Selection Guidelines and make a decision. Similarly the Panel will also consider the deletion of sites that no longer satisfy the selection criteria. The process of review is essential to ensure a common standard is maintained in line with government guidance that sites should be of "substantive nature conservation interest." To ensure consistency, a standard form will be completed for each site proposed for addition or deletion to the system as appropriate. The same process identified in section 1.4.1 will be followed with regard to identification in district Local Development Frameworks.

1.4.4 Determining SINC boundaries

Once a SINC has been identified, consideration is given to the boundaries, to ensure that the area of land that meets the selection guidelines is included within the SINC boundary. In addition, boundaries have been drawn so they can be readily located on maps and on the ground. Care has been taken to ensure they are not drawn to include significant areas of land that does not meet the selection guidelines and thus place an undue constraint on potential development. They may, however, include habitat that is of lesser value where it is an integral part of the management unit and occupies a minority (i.e. less than 50%) of area of the land parcel under consideration.

When determining SINC boundaries:

-
- (a) The boundary should be determined by readily identifiable management units (e.g. a hay meadow, a woodland, a roadside verge etc.) when the majority of the area concerned meets the SINC selection criteria.
 - (b) Where there is an aggregation of separate management units adjacent to each other, the boundary should be drawn to include all sites as a single SINC.
 - (c) Where there is a grouping of separate management units of the same habitat type (e.g. a series of unimproved meadows) that are in close proximity to each other, they may also be referred to as a single SINC.
 - (d) For large stands of a single habitat type with only a minority of the area being of SINC quality or of marginal SINC quality, the boundary may be drawn to the nearest topographic feature or a line between two features, so that the majority of the area of land identified as a SINC is of SINC quality.
 - (e) For wetland SINC where the protection of the water supply and quality is vital to maintenance of the interest of the SINC the boundary may be drawn to include the immediate catchment of the site where a boundary can be readily identified by observable physical boundaries or topographic features. It is acknowledged that buffer zones are important for wetlands in protecting the supply and quality of water. Consequently, these may warrant inclusion within a SINC designation for this particular function.
 - (f) For mixed habitat sites that are not part of recognised traditional land management units (e.g. post-industrial land) the boundary may be drawn to include all areas of individual habitats of SINC quality and all other areas of habitat that in combination meet the mixed habitat selection guidelines. The boundary may be drawn to the nearest topographic feature or a line between two features or an observable physical boundary habitat, so that the majority of the area is of SINC quality, these sites are often referred to as complexes.
 - (g) For upland habitats the lower limit of unenclosed moorland would be taken to the moorland line, although in some instances the inclusion of allotments around the moorland edge would be appropriate where they contain extensive stands of high quality upland habitat.
 - (h) For species or species assemblages of SINC quality that have a requirement for different habitats and land parcels during their life cycle, SINC boundaries may be drawn to include all habitats or features that can be shown to be important to the maintenance of the interest of the SINC.
 - (i) For rivers it can be difficult to determine static boundaries, due to the dynamic nature of rivers, for example rivers may change course through erosion; quickly rendering SINC maps out of date. The SINC boundary should be to fixed points upstream and downstream such as bridges, weirs and field boundaries and to the bank full point of the river. Flood banks should only be used to define the river channel where the flood bank directly abuts the river. For dynamic systems the boundaries should be regularly checked and/or determined on the ground as and when required.

1.5 Operation of the SINC System

The North Yorkshire SINC system is run jointly by North Yorkshire County Council, the North Yorkshire SINC Steering Group, the North Yorkshire SINC Panel and NEYEDC.

The roles of the SINC Steering Group and SINC Panel have been outlined previously in this document. North Yorkshire County Council is responsible for the administration of the SINC system and NEYEDC is responsible for data capture, management and distribution.

1.5.1 Administration

North Yorkshire County Council is responsible for convening and administering the SINC Panel. The County Council provides the central contact for all SINC Panel members with regard to queries or advice that may be required on the operation of the SINC system. All member organisations of the SINC Panel are involved with the SINC system, including site protection and management, and liaise with each other as necessary.

Where new sites are added to the SINC system or others deleted, North Yorkshire County Council will update records via NEYEDC as indicated in the following section (1.5.2).

1.5.2 SINC data capture, management and distribution

NEYEDC is responsible for the updating and maintenance of the North Yorkshire SINC data, under a Service Level Agreement with North Yorkshire County Council.

1.5.2.1 Data storage and management

Data is held by NEYEDC on in house servers, using a dedicated SQL server and a file server. The servers are professionally managed through a contract with an IT support company. The data held on the servers is fully backed up such that a back up is always available to restore the system to a point which is a maximum of 24 hours old. A weekly off site backup is also maintained.

Data is produced by the SINC surveys in two formats. Geographical data includes site boundaries, habitat parcel mapping and linear features such as hedges. NEYEDC stores this data in GIS format using the MapInfo GIS system. Written data collected during the site surveys includes location information, topographic information, site description, species list and current management. This information is stored in the Recorder 6 database, a relational database hosted on the SQL server. The Recorder 6 software is supported and updated by JNCC.

NEYEDC will amend the data at the request of the SINC Panel to reflect any changes in designation status or boundaries.

1.5.2.2 Data capture

NEYEDC assists North Yorkshire County Council in obtaining landowner permissions to visit sites by providing maps illustrating the areas intended for survey. NEYEDC also provide maps to enable surveyors to map the habitats identified during site surveys.

The mapped data is supplied to NEYEDC by the surveyors as hand drawn maps showing site boundaries and habitat parcels present on the site. NEYEDC digitises this data according to the current Natural England GIS guidelines.

Species lists, site descriptions and other information to be stored in Recorder 6 is input using a specifically designed input tool. The tool uses the Recorder 6 database to verify spellings of species latin names and ensures accuracy in the input of the survey data.

1.5.2.3 Data distribution

NEYEDC makes the SINC data available online to stakeholders of the SINC partnership, including both maps and SINC citations, using a standard internet browser. NEYEDC controls access to the resources and ensures that the most up to date version is available to stakeholders.

NEYEDC can also provide, on demand, a printed site survey report and habitat map for any SINC that has been surveyed. NEYEDC will provide this service to SINC stakeholders and enquirers to the data centre such as ecological consultants or naturalists.

NEYEDC is continually working with the SINC Steering Group to review and update the SINC storage and management systems in line with the requirements of the Partnership and often in light of new guidance, the most recent of this being National Indicator 197, which has led to the need to develop a mechanism for reporting upon the indicator on management activities.

PART TWO:

Guidelines for the selection of biological Sites of Importance for Nature Conservation

A. Habitat Selection Guidelines

Habitat Selection Guidelines

2.1 Grassland

Grasslands under this set of habitat guidelines include traditionally managed meadows and pastures of lowland and upland situations on neutral, acid and calcareous soils.

2.1.1 Neutral grassland

Unimproved neutral grassland habitat underwent a major decline in the 20th century. It was estimated in 1994 that less than 15,000ha of species-rich neutral grassland remained within the UK (both upland and lowland). In England there is significantly less than 10,000ha of species-rich neutral grassland⁵. As a result, this habitat now remains throughout much of the UK in small sites with a localised and fragmented distribution.

Neutral grasslands support a high proportion of forbs (broad-leaved herbaceous species) relative to grasses. Characteristic species of this habitat, which are now scarce, include green-winged orchid (*Orchis morio*), pepper saxifrage (*Silvaum silaus*), dyer's greenweed (*Genista tinctoria*) and adder's-tongue fern (*Ophioglossum vulgatum*). Commoner characteristic species include meadow crane's-bill (*Geranium pratense*), yellow rattle (*Rhinanthus minor*), pignut (*Conopodium majus*) and red clover (*Trifolium pratense*).

Semi-natural neutral grasslands occur in a range of circumstances in upland and lowland locations. Upland hay meadows are the subject of a separate UK Habitat Action Plan, whereas lowland neutral grasslands are covered by UK Habitat Action Plans for lowland meadows and coastal and floodplain grazing marsh. In lowland areas species-rich neutral grasslands, as described in the Habitat Action Plan for meadows, correspond to the NVC communities MG4 *Alopecurus pratensis-Sanguisorba officinalis*, MG5 *Cynosurus cristatus-Centaurea nigra* and MG8 *Cynosurus cristatus-Caltha palustris* grasslands. MG4 and MG8 are associated with seasonally flooded communities and are particularly rare, covering in England and Wales less than 1500ha and 1000ha respectively.⁶

Other NVC communities also occur in unimproved neutral grasslands, extensively in some instances. They include stands of MG1 grassland and in wetter circumstances, stands of MG9, MG10, MG11 and MG13 grassland communities. MG7 and to a lesser extent MG6 are communities of agriculturally improved grassland and are, generally from a botanical point of view, of much less nature conservation interest. It should be noted however, that some stands of MG6 can support a range of species more characteristic of unimproved swards.

There is a UK Habitat Action Plan for upland hay meadows that correspond to the NVC community MG3 *Anthoxanthum odoratum-Geranium sylvaticum*. This grassland community occupies less than 1000ha in England and less than 100 ha in Scotland. Upland hay meadows are confined to areas of non-intensive management in a sub-montane climate. Most stands of the habitat are less than 2ha in extent. Northern England is a stronghold for upland hay meadows and one of the main concentrations is in the northern Pennines of North Yorkshire.

In North Yorkshire neutral grassland occurs in all Natural Areas and administrative districts. In upland areas outside the National Parks, upland hay meadows are present in the Yorkshire Dales, Pennine Dales Fringe, Forest of Bowland and Lancashire Plain and Valleys Natural Areas in the

⁵ UK Biodiversity Steering Group (1995). Biodiversity: the UK steering group report. Volume 2: Action Plans. HMSO, London.

⁶ UK Biodiversity Group Tranche 2 Action Plans. Volume II – terrestrial and freshwater habitats(1998). HMSO, London.

Districts of Richmond and Craven (Selman, Dodd and Bayes, 1999)⁷. It is estimated that North Yorkshire supports approximately 96 ha of this habitat (Cooper and Rodwell, 1996)⁸. A useful breakdown of the occurrence and estimated cover of species-rich neutral grassland by local planning authority boundaries is provided in Table 12 of the publication "A Biodiversity Audit of Yorkshire and the Humber" (Selman, Dodd and Bayes, 1999).

2.1.2 Acid grasslands

Acid grasslands typically occur on nutrient-poor acid substrates situated on acidic rocks, sands or gravels. Acid grassland can also occur on wetter substrates such as peat that can mask the nature of the underlying rocks. These grasslands occur in a range of circumstances in upland and lowland locations and are often associated with other habitats such as upland and lowland heathland, parkland, flushes, blanket bogs and other mire types. In most circumstances, they are managed as grazing pasture whether in upland or lowland situations.

Acid grasslands are typically botanically species-poor. In the uplands they can form large expanses of uniform habitat, but in other circumstances where there are differences in rainfall, altitude, and hydrology a range of communities can develop.

In the UK Biodiversity Action Plan there is a Habitat Action Plan for lowland dry acid grassland. No specific plan has been produced for upland acid grasslands. Estimated coverage of upland acid grassland in the UK, however, is over 1,200,000ha. In the uplands acid grassland is often of low botanical interest and can develop as a result of management such as, overgrazing, and drainage of other habitats including dwarf-shrub heath. However more species rich upland acid grasslands are rarer and of value, in the context of inbye land on moorland edge, which is often heavily improved.

Lowland dry acid grassland occurs on free-draining acidic soils often associated with acidic rocks, sands or gravels. Characteristic plant species include heath bedstraw (*Galium saxatile*), sheep's fescue (*Festuca ovina*), sheep's sorrel (*Rumex acetosella*), common bent grass (*Agrostis capillaris*), wavy hair-grass (*Deschampsia flexuosa*), tormentil (*Potentilla erecta*) and heather species at low abundance. In the UK there is estimated to be only 30,000ha of lowland dry acid grassland with only approximately 50ha or less in North Yorkshire, where it is principally associated with the Vale of York and Mowbray and Humberhead Levels Natural Areas.

In lowland areas with poorly drained acidic soils, purple moor-grass and rush pasture communities develop, often in a mosaic with other habitats. These grassland communities are present in the Vale of York and Mowbray and Humberhead Levels Natural Areas in North Yorkshire, but are rare.

2.1.3 Calcareous grassland

Calcareous grassland occurs on shallow lime-rich soils, usually derived from limestone rocks. There are two separate Habitat Action Plans for calcareous grassland in the UK, for both upland and lowland grasslands. The Action Plans distinguish between lowland calcareous grasslands of NVC communities CG1 to CG9 and upland calcareous grasslands of CG9 to CG14. The community CG9 *Sesleria albicans-Galium sternerii* straddles both the uplands and the lowlands.

It is estimated that 55-66,000ha of calcareous grassland occurs in the UK of which 33,000-41,000ha lies within the lowlands and 22,000-25,000ha occurs within the uplands.⁹ The bulk of the lowland calcareous grassland resource lies on chalk at 25,000 – 32,000ha. Nearly two-thirds of all chalk grassland is found in Wiltshire. The remainder is found in a variety of locations elsewhere

⁷ Selman, R., F. Dodd and K. Bayes (1999) A Biodiversity Audit of Yorkshire and the Humber. Yorkshire and Humber Biodiversity Forum.

⁸ Cooper, E and J. Rodwell (1996). Northern Hay Meadows. Report for WWF.

⁹ UK Biodiversity Group Tranche 2 Action Plans. Volume II – terrestrial and freshwater habitats (1998). HMSO, London.

including many dry valleys of the Yorkshire Wolds, where several NVC grassland communities occur, such as, CG7. Of the upland calcareous grassland in the UK approximately 10,000 ha is found in England.

Calcareous grasslands often support a very rich flora with many locally and nationally rare species. Invertebrate faunas can also be very rich supporting a good number of nationally scarce species. Carboniferous limestone grassland of the Craven Pennines in North Yorkshire is a significant component of the upland resource.

Road verges also constitute an important grassland resource in North Yorkshire. For example, within the Howardian Hills AONB there is only approximately 15 ha (total area of HHAONB is 20,400ha) of calcareous grassland and a significant proportion of this area occurs on road verges, particularly where the underlying substrates have been exposed.

The vast majority of the North York Moors and Hills, and the Yorkshire Dales Natural Areas, lie within the National Park boundaries. This means that a substantial area of the calcareous limestone grassland (principally upland) lies outside the remit of this SINC system.

In North Yorkshire calcareous grasslands are associated with shallow lime-rich soils overlying:

- The Carboniferous limestone in the west and north-west of the county in the Yorkshire Dales Natural Area in the districts of Richmond, Harrogate and Craven.
- The Magnesian Limestone laid down in the Permian period that extends from Sunderland south to Nottingham. It forms a narrow belt running either side of the A1 that is no more than 8km wide at any given point. In North Yorkshire, the Magnesian limestone forms its own Natural Area – the Southern Magnesian Limestone and it occurs primarily within the district of Harrogate, but may also occur in Hambleton and Richmond. There are only a few hundred hectares of calcareous grassland on Magnesian limestone remaining within England¹⁰.
- The Corallian limestone, from the Jurassic period, that outcrops between the foothills of the North York Moors and the Vale of Pickering in the North York Moors and Hills Natural Area.
- The Cretaceous chalk that outcrops in the Yorkshire Wolds Natural Area in the east of the county in the Districts of Scarborough and Ryedale

A useful breakdown of the occurrence and estimated cover of unimproved and semi-improved calcareous grassland by local planning authority boundaries is provided in Table 13 of the publication *"A Biodiversity Audit of Yorkshire and the Humber"* (Selman, Dodds and Bayes, 1999).

¹⁰ Drewett, J. Magnesian Limestone Grassland and its Conservation. In: British Wildlife Volume 9, Number 4, April 1998

2.1.4 Selection Criteria and Attributes

Table 5 Selection criteria and attributes for grassland SINC

CRITERION	ATTRIBUTE
Size	Area of site or length of verge. Given that the appropriate vegetation communities or characteristic species are present throughout the site area.
Representativeness	Presence of typical/characteristic species that represent good examples of the habitat type within the county, the relevant Natural Area or locality. This will be as defined by NVC community types where data is available. Presence of habitats or species that are characteristic, distinctive or unique to the county, Natural Area or locality.
Diversity	Number of grassland plant species recorded as a total and presence of characteristic grassland species.
Rarity	Presence of nationally rare or declining plant species. Presence of regionally important species. Presence of locally rare or declining plant species. Presence of vegetation communities that are rare or of restricted distribution.
Naturalness	Presence, cover & variety of semi-natural grassland communities and species that correspond to long established grassland habitat.
Position in an ecological unit	Location or proximity of site in relation to other recognised sites of interest either as similar habitat or habitat mosaic. The site is part of a recognised wildlife corridor.

The species referred to above are included within the species list associated with each grassland type i.e. calcareous, unimproved, and semi-improved neutral and acid. Nationally rare, declining or scarce plant species are included in the lists, where appropriate, and they are also subject of separate selection guidelines for rare plants.

Where the use of species is specified as a measurable attribute, reference should be made to the species list for each of calcareous, acid and neutral grassland and to the nationally important species list shown elsewhere in the report. The status of species within the lists for different grassland habitats, are either regionally important species, locally rare, scarce or declining or locally distinctive species based on current available data.

Species believed to be casual occurrences or of introduced origin have should be disregarded.

2.1.5 General application to all grassland guidelines

The following guidelines are applicable to grassland communities that occur on naturally occurring substrates. Non-natural substrates such as pulverised fuel ash and those resulting from soil mixing are included within the guidelines for habitats on artificial substrates. Recently sown 'wildflower meadows' (i.e. sown within the last 25 years) are not eligible for consideration under these guidelines. Grassland communities occurring on road verges, disused quarries, disused railway cuttings are all included here. Seasonally flooded grasslands of the MG4 NVC community are included in this section, whereas marshy grassland as defined in the Phase 1 survey methodology can be included under neutral grassland or the fen, lowland acid mires, springs & flushes guidelines. Coastal grasslands are included within the maritime cliff and slope section.

The species listed in Tables 6, 7 and 8 not in bold type score 1 point, whilst those in bold type score 2 points. The species included in the tables are representative of species characteristic of agriculturally unimproved, species-rich grassland swards. Examination of the NVC communities

and experience of past habitat and vegetation surveys indicates these species are largely restricted to good examples of the semi-natural grassland communities in North Yorkshire. Commonly occurring species such as false oat grass (*Arrhenatherum elatius*), Yorkshire Fog grass (*Holcus lanatus*) and cock's-foot grass (*Dactylis glomerata*) are not included in the lists as they can occur in improved and relatively species-poor grassland communities and do not impart a sense of quality.

The selection of a grassland SINC using the species lists in the tables should ensure the species recorded exhibit a reasonable distribution throughout the sward in all or a significant proportion of the site. If the species recorded from the lists are present, but in low numbers or restricted to small patches within the sward or to the edges of the site then the site should not normally be eligible for SINC selection.

2.1.6 Grassland Selection Guidelines

Grassland sites will be eligible for selection as a SINC if they meet any of the following guidelines.

Guideline

Gr1

Areas of ancient semi-natural neutral and calcareous grasslands of at least 0.1 ha in size, or at least 50m in length if the site is a road verge and the area unquantified, that support stands of one or more of the following NVC community types:

MG2	<i>Arrhenatherum elatius-Filipendula ulmaria</i>
MG3	<i>Anthoxanthum odoratum-Geranium sylvaticum</i>
MG4	<i>Alopecurus pratensis-Sanguisorba officinalis</i>
MG5	<i>Cynosurus cristatus-Centaurea nigra</i>
MG8	<i>Cynosurus cristatus-Caltha palustris</i>
CG9	<i>Sesleria albicans-Galium sternerii</i>
CG10	<i>Festuca ovina-Agrostis capillaris-Thymus praecox</i>
U4c	<i>Festuca ovina-Agrostis capillaris-Galium saxatile (Lathyrus montanus-Stachys officinalis)</i>
U1c	<i>Festuca ovina-Agrostis capillaris-Rumex acetosella grassland, Erodium cicutarium-Teesdalia nudicaulis sub-community</i>

Application

This guideline will be applied to areas of ancient or long established semi-natural grassland that have been identified as supporting the NVC communities listed above. A competent surveyor should base classification of the community on field assessment.

Rationale

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

Guideline

Gr2

Areas of old, established semi-natural neutral and calcareous grassland of at least 0.5 ha in size, or at least 50m in length, if the site is a road verge, (excluding the Vale of Pickering, Vale of York and Mowbray and Humberhead Levels, Tees Lowlands¹¹ and North York Moors and Hills Natural Areas, see Gr4) scoring 12 or more from the neutral grassland plant species listed in Table 6 or the calcareous grassland species listed in Table 7.

Application

This guideline is applicable to dry and wet neutral grassland communities in lowland areas. This guideline should be applied to either ancient or long-established grasslands only. Grasslands of known recently sown origin are not eligible under this guideline. The grassland community may support a wide range of NVC types, but collectively overall species recorded must score 12 or more from either Table 6 or 7.

Rationale

Long-established species-rich semi-natural grasslands have declined considerably throughout the UK and North Yorkshire over the last 50 years. Further losses will diminish the nature conservation resource within North Yorkshire and once lost these habitats are difficult or impossible to replace.

Vegetation stands, such as roadside verges, that are not within agricultural units have often been colonised from such grasslands in the locality when these communities were much more widespread in the agricultural environment.

Guideline

Gr3

a) Areas of lowland acid grassland of at least 0.25ha in size, or 50 metres in length if a roadside verge, that score 8 or more from the acid grassland plant species list in Table 8.

or

b) Areas of enclosed upland acid grassland typically above 250m, but below the moorland line, of at least 0.5ha in size, which score 12 or more from the acid grassland list and have less than 50% heath cover.

Application

This guideline is applicable to dry and wet acid grassland communities in lowland areas. These communities may occur in combination with lowland heathland and mire habitats and typically supports NVC community types U1 & U2. The upland acid grassland guideline is applicable to communities that typically support U4 & U5.

Rationale

Lowland acid grassland is a rare habitat in North Yorkshire being restricted to between 50ha and 70ha in total. Species rich acid grassland typically above 250m is a scarce habitat in North Yorkshire.

¹¹ Tees Lowlands Natural Area was excluded from guideline Gr2 and added to guidelines Gr4 in May 2006 following agreement at the SINC Panel meeting on 21st February 2006.

Guideline

Gr4

Areas of semi-natural neutral grassland of at least 0.25ha, or at least 50m in length if the site is a road verge, which lie within the Vale of York and Mowbray, Vale of Pickering, the Humberhead Levels, Tees Lowlands and the North York Moors and Hills Natural Areas or calcareous grasslands of at least 0.1ha in size, or at least 50m in length if the site is a road verge within the North York Moors and Hills or Lancashire Plain & Valleys Natural Areas scoring 8 or more from the neutral or calcareous grassland species lists in Tables 6 and 7 respectively.

Application

This guideline will only be applied to semi-natural neutral and calcareous grasslands in the Natural Areas specified.

Rationale

Owing to widespread agricultural intensification in these Natural Areas, there are few remnants of species-rich semi-natural neutral and calcareous grasslands. To ensure the full variety of biodiversity and habitat types is maintained throughout all Natural Areas in North Yorkshire the lower threshold of 8 species has been selected to ensure that good examples of long-established semi-natural grassland in these Natural Areas are included in the SINC list.

Guideline

Gr5

Areas of semi-natural grassland of at least 0.5 ha in size, or at least 50m in length if the site is a road verge scoring 20 or more from the acid, neutral and calcareous grassland plant species lists in combination.

Application

This guideline can be applied to mixed grassland sites where the area of each particular grassland community is too small to be considered under any of the other guidelines, or where the individual stands of the different grassland types do not meet the selection threshold scores. In combination, however, they support a diverse variety of plants of unimproved grassland. Unimproved grassland should cover the majority of the site and support indicator plant species throughout the sward. Species presented in both the neutral and calcareous grassland lists should only be counted once.

Rationale

Some grassland sites can support an intricate mosaic of acid through to calcareous grassland communities especially where there are gradients in slope, transitions from one geological type to another and a variety of hydrological conditions. These grasslands can be extremely valuable and diverse, but also atypical. This guideline is intended to ensure such sites are not undervalued

Guideline

Gr6

Areas of semi-natural grassland, which adjoin or lie within 500 metres of an existing grassland statutory site or SINC and have a score within 20% of the thresholds listed in the other Gr Guidelines.

Application

This guideline can be applied to any grassland site that does not meet any of the above guidelines and which is within close proximity to an existing grassland statutory site or SINC. Two or more sites which are within 20% of the thresholds listed in other Gr Guidelines within 500 metres of each other, but not within 500 metres of a grassland statutory site or SINC should not be designated.

Rationale

The role and importance of linear continuous habitats and blocks of habitat that act as stepping stones or patches of habitat has been well studied in relation to population dynamics and rates of extinction, immigration and emigration of individuals of species from one habitat patch to another. As a consequence, the importance of linear habitats in the countryside and urban areas is recognised in planning policy guidance and the EU Habitats Directive. This guideline enables groupings of grassland of similar quality to be included in a SINC where some components of the group individually do not quite meet the thresholds for SINC selection.

Table 6: Plant species of semi-natural neutral grassland

<u>Scientific name</u>	<u>Common name</u>
<i>Achillea ptarmica</i>	sneezewort
<i>Agrimonia eupatoria</i>	agrimony
<i>Agrostis canina</i>	velvet bent
<i>Alchemilla</i> spp(native)	lady's mantle spp (except <i>A. mollis</i>)
<i>Allium oleraceum</i>	field garlic
<i>Allium scorodprasum</i>	sand leek
<i>Ajuga reptans</i>	bugle
<i>Anacamptis pyramidalis</i>	pyramidal orchid
<i>Anemone nemorosa</i>	wood anemone
<i>Anthoxanthum odoratum</i>	sweet vernal-grass
<i>Botrychium lunaria</i>	moonwort
<i>Briza media</i>	quaking grass
<i>Bromus commutatus</i>	meadow brome
<i>Bromus racemosus</i>	smooth brome
<i>Caltha palustris</i>	marsh marigold
<i>Campanula glomerata</i>	clustered bellflower
<i>Campanula rotundifolia</i>	harebell
<i>Cardamine pratensis</i>	lady's smock
<i>Carex</i> spp	any sedge (except <i>C. hirta</i>)
<i>Centaurea nigra</i>	black knapweed
<i>Cirsium heterophyllum</i>	melancholy thistle
<i>Conopodium majus</i>	pignut
<i>Dactylorhiza fuchsii</i>	common spotted orchid
<i>Danthonia decumbens</i>	heath grass
<i>Euphrasia</i> spp.	eyebright species
<i>Festuca pratensis</i>	meadow fescue
<i>Filipendula ulmaria</i>	meadowsweet
<i>Galium palustre</i>	common marsh-bedstraw
<i>Galium verum</i>	lady's-bedstraw
<i>Galium uliginosum</i>	fen bedstraw
<i>Genista tinctoria</i>	dyer's greenweed
<i>Geranium pratense</i>	meadow cranesbill
<i>Geranium sylvaticum</i>	wood cranesbill
<i>Geum rivale</i>	water avens
<i>Helictotrichon pratense</i>	meadow oat-grass
<i>Helictotrichon pubescens</i>	hairy meadow grass
<i>Hordeum secalinum</i>	meadow barley
<i>Hypericum tetrapterum</i>	square-stalked St John's-wort
<i>Juncus acutiflorus</i>	sharp-flowered rush
<i>Juncus subnodulosus</i>	blunt-flowered rush
<i>Knautia arvensis</i>	field scabious
<i>Lathyrus linifolius</i>	bitter vetchling
<i>Lathyrus pratensis</i>	meadow vetchling
<i>Leontodon hispidus</i>	rough hawkbit
<i>Leontodon saxatilis</i>	lesser hawkbit
<i>Leucanthemum vulgare</i>	ox-eye daisy
<i>Listera ovata</i>	common twayblade
<i>Lotus corniculatus</i>	bird's-foot trefoil
<i>Lotus pedunculatus</i>	greater birds-foot-trefoil
<i>Lychnis flos-cuculi</i>	ragged robin
<i>Lysimachia nummularia</i>	creeping jenny
<i>Oenanthe silaifolia</i>	narrow-leaved water dropwort
<i>Ononis repens</i>	common restharrow
<i>Ononis spinosa</i>	spiny restharrow

Table 6 (cont.): Plant species of semi-natural neutral grassland

<u>Scientific name</u>	<u>Common name</u>
<i>Ophioglossum vulgatum</i>	adder's-tongue fern
<i>Ophrys apifera</i>	bee orchid
Orchidaceae	any taxa except those listed separately
<i>Orchis mascula</i>	early purple orchid
<i>Pedicularis palustris</i>	marsh lousewort
<i>Pedicularis sylvatica</i>	lousewort
<i>Persicaria bistorta</i>	common bistort
<i>Pimpinella saxifraga</i>	burnet-saxifrage
<i>Plantago media</i>	hoary plantain
<i>Polygala vulgaris</i>	common milkwort
<i>Potentilla erecta</i>	tormentil
<i>Primula veris</i>	cowslip
<i>Primula vulgaris</i>	primrose
<i>Ranunculus bulbosus</i>	bulbous buttercup
<i>Ranunculus flammula</i>	lesser spearwort
<i>Rhinanthus minor</i>	yellow rattle
<i>Salix repens</i>	creeping willow
<i>Sanguisorba minor</i>	salad burnet
<i>Sanguisorba officinalis</i>	great burnet
<i>Saxifraga granulata</i>	meadow saxifrage
<i>Serratula tinctoria</i>	saw-wort
<i>Silaum silaus</i>	pepper saxifrage
<i>Stachys officinalis</i>	betony
<i>Stellaria graminea</i>	lesser stichwort
<i>Succisa pratensis</i>	devil's-bit scabious
<i>Thalictrum flavum</i>	common meadow rue
<i>Trifolium medium</i>	zigzag clover
<i>Triglochin palustris</i>	marsh arrow grass
<i>Trisetum flavescens</i>	yellow oat-grass
<i>Trollius europaeus</i>	globeflower
<i>Viola lutea</i>	mountain pansy

Table 7: Plant species of semi-natural calcareous grasslands

<u>Scientific name</u>	<u>Common name</u>
Acinos arvensis	basil thyme
<i>Agrimonia eupatoria</i>	agrimony
<i>Alchemilla</i> spp (native)	lady's mantle spp (except <i>A. mollis</i>)
<i>Allium oleraceum</i>	field garlic
Allium scorodprasum	sand leek
<i>Anacamptis pyramidalis</i>	pyramidal orchid
<i>Anthyllis vulneraria</i>	kidney vetch
<i>Arabis hirsuta</i>	hairy rock-cress
Asperula cynanchica	squinancywort
Astragalus danicus	purple milk vetch
<i>Blackstonia perfoliata</i>	yellow-wort
Botrychium lunaria	moonwort
<i>Brachypodium pinnatum</i>	tor grass
<i>Briza media</i>	quaking grass
<i>Bromopsis erecta</i>	upright brome
<i>Campanula glomerata</i>	clustered bellflower
<i>Campanula rotundifolia</i>	harebell
Carex digitata	fingered sedge
Carex ericetorum	rare spring sedge
<i>Carex</i> spp	any other sedge (except <i>C. hirta</i>)
<i>Carlina vulgaris</i>	carline thistle
<i>Catapodium rigidum</i>	fern-grass
<i>Centaurea scabiosa</i>	greater knapweed
<i>Cerastium arvense</i>	field mouse-ear
<i>Cirsium acaule</i>	dwarf thistle
<i>Cirsium eriophorum</i>	woolly thistle
<i>Clinopodium vulgare</i>	wild basil
<i>Conopodium majus</i>	pignut
<i>Dactylorhiza fuchsii</i>	common spotted orchid
<i>Daucus carota</i>	wild carrot
<i>Erigeron acer</i>	blue fleabane
<i>Erophila</i> spp	whitlow grasses
<i>Euphrasia</i> spp.	eyebright species
<i>Festuca ovina</i>	sheep's fescue
<i>Filipendula vulgaris</i>	dropwort
<i>Fragaria vesca</i>	wild strawberry
Galeopsis angustifolia	red hemp nettle
Galium sternerii	limestone bedstraw
<i>Galium verum</i>	lady's bedstraw
Genista tinctoria	dyer's greenweed
<i>Gentianella amarella</i>	autumn gentian
Geranium sanguineum	bloody cranesbill
<i>Helianthemum nummularium</i>	common rockrose
<i>Helictotrichon pratense</i>	meadow oat-grass
<i>Helictotrichon pubescens</i>	hairy oat-grass
Hippocrepis comosa	horseshoe vetch
<i>Hypericum hirsutum</i>	hairy St John's wort
Hypericum montanum	pale St John's wort
<i>Hypericum perforatum</i>	peforate St John's wort
<i>Koeleria macrantha</i>	crested hair-grass
<i>Knautia arvensis</i>	field scabious
<i>Leontodon hispidus</i>	rough hawkbit
<i>Leontodon saxatilis</i>	lesser hawkbit
<i>Linum catharticum</i>	fairy flax
<i>Listera ovata</i>	twayblade

Table 7 (cont.): Plant species of semi-natural calcareous grasslands

<u>Scientific name</u>	<u>Common name</u>
<i>Lotus corniculatus</i>	birds-foot-trefoil
<i>Minuartia verna</i>	spring sandwort
<i>Myosotis ramosissima</i>	early forget-me-not
<i>Ononis repens</i>	restharrow
<i>Ononis spinosa</i>	spiny restharrow
<i>Ophrys apifera</i>	bee orchid
Orchidaceae	any taxa except those listed separately
<i>Orchis mascula</i>	early purple orchid
<i>Origanum vulgare</i>	wild marjoram
<i>Orobanche alba</i>	thyme broomrape
<i>Orobanche elatior</i>	knapweed broomrape
<i>Orobanche reticulata</i>	thistle broomrape
<i>Parnassia palustris</i>	grass of Parnassus
<i>Picris hieracioides</i>	hawkweed ox tongue
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pimpinella saxifraga</i>	burnet saxifrage
<i>Plantago media</i>	hoary plantain
<i>Polygala vulgaris</i>	common milkwort
<i>Potentilla neumanniana</i>	spring cinquefoil
<i>Primula farinosa</i>	bird's-eye primrose
<i>Primula veris</i>	cowslip
<i>Ranunculus parviflorus</i>	small flowered buttercup
<i>Rhinanthus minor</i>	yellow rattle
<i>Rosa mollis</i>	soft downy rose
<i>Rosa pimpinellifolia</i>	burnet rose
<i>Sanguisorba minor</i>	salad burnet
<i>Saxifraga granulata</i>	meadow saxifrage
<i>Saxifraga hypnoides</i>	mossy saxifrage
<i>Saxifraga tridactylites</i>	rue leaved saxifrage
<i>Scabiosa columbaria</i>	small scabious
<i>Sedum acre</i>	biting stonecrop
<i>Serratula tinctoria</i>	saw-wort
<i>Sesleria albicans</i>	blue moor-grass
<i>Succisa pratensis</i>	devil's bit scabious
<i>Thalictrum minus</i>	lesser meadow rue
<i>Thymus polytrichus</i>	wild thyme
<i>Thymus pulegioides</i>	large thyme
<i>Torilis nodosa</i>	knotted hedge-parsley
<i>Trisetum flavescens</i>	yellow oat-grass
<i>Valerianella locusta</i>	common cornsalad
<i>Viola hirta</i>	hairy violet
<i>Viola lutea</i>	mountain pansy

Table 8: Plant species of semi-natural acid grassland

<u>Scientific name</u>	<u>Common name</u>
<i>Achillea ptarmica</i>	sneezewort
<i>Agrimonia procera</i>	fragrant agrimony
<i>Agrostis canina</i>	velvet bent
<i>Aira caryophylla</i>	silvery hair-grass
<i>Aira praecox</i>	early hair-grass
<i>Anemone nemorosa</i>	wood anemone
<i>Apera interrupta</i>	dense silky bent
<i>Calluna vulgaris</i>	heather
<i>Campanula rotundifolia</i>	harebell
<i>Carex spp</i>	any sedge
<i>Cerastium arvense</i>	field mouse-ear
<i>Cerastium semidecandrum</i>	little mouse-ear
<i>Conopodium majus</i>	pignut
<i>Dactylorhiza fuchsii</i>	common spotted orchid
<i>Danthonia decumbens</i>	heath-grass
<i>Deschampsia flexuosa</i>	wavy hair-grass
<i>Empetrum nigrum</i>	crowberry
<i>Erica cinerea</i>	bell-heather
<i>Erica tetralix</i>	cross-leaved heath
<i>Erodium cicutarium</i>	common stork's-bill
<i>Erophila verna agg</i>	whitlow grasses
<i>Festuca ovina</i>	sheep's fescue
<i>Filago minima</i>	small cudweed
<i>Filago vulgaris</i>	common cudweed
<i>Galium saxatile</i>	heath bedstraw
<i>Galium verum</i>	lady's bedstraw
<i>Genista anglica</i>	petty whin
<i>Genista tinctoria</i>	dyer's greenweed
<i>Gnaphalium sylvaticum</i>	heath cudweed
<i>Hydrocotyle vulgaris</i>	marsh pennywort
<i>Hypericum pulchrum</i>	slender St John's-wort
<i>Hypochaeris glabra</i>	smooth cat's-ear
<i>Juncus squarrosus</i>	heath rush
<i>Lathyrus linifolius</i>	bitter vetch
<i>Lotus corniculatus</i>	bird's-foot trefoil
<i>Luzula campestris</i>	field woodrush
<i>Luzula multiflora</i>	heath woodrush
<i>Molinia caerulea</i>	purple moor-grass
<i>Myosotis discolor</i>	changing forget-me-not
<i>Myosotis ramosissima</i>	early forget-me-not
<i>Myosotis secunda</i>	creeping forget-me-not
<i>Myosotis stolonifera</i>	pale forget-me-not
<i>Nardus stricta</i>	mat-grass
<i>Orchidaceae</i>	any orchid species except <i>D. fuchsii</i>
<i>Ornithopus purpusillus</i>	bird's-foot
<i>Pedicularis palustris</i>	marsh lousewort
<i>Pedicularis sylvatica</i>	lousewort
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Polygala serpyllifolia</i>	thyme-leaved milkwort
<i>Potentilla anglica</i>	trailing tormentil
<i>Potentilla erecta</i>	common tormentil
<i>Potentilla sterilis</i>	barren strawberry
<i>Potentilla x mixta</i>	hybrid cinquefoil
<i>Rumex acetosella</i>	sheep's sorrel

Table 8 (cont.) Plant species of semi-natural acid grassland

<u>Scientific name</u>	<u>Common name</u>
<i>Sagina nodosa</i>	knotted pearlwort
<i>Salix repens</i>	creeping willow
<i>Scleranthus annuus</i>	annual knawel
<i>Stachys officinalis</i>	betony
<i>Stellaria graminea</i>	lesser stichwort
<i>Stellaria pallida</i>	lesser chickweed
<i>Succisa pratensis</i>	devil's-bit scabious
<i>Teesdalia nudicaulis</i>	shepherd's-cress
<i>Thymus polytrichus</i>	wild thyme
<i>Trichophorum cespitosum</i>	deerglass
<i>Trifolium arvense</i>	hare's-foot clover
<i>Trifolium micranthum</i>	slender trefoil
<i>Trifolium scabrum</i>	rough clover
<i>Trifolium striatum</i>	knotted clover
<i>Trifolium subterraneum</i>	subterranean clover
<i>Vaccinium myrtillus</i>	bilberry
<i>Veronica officinalis</i>	heath speedwell
<i>Vicia lathyroides</i>	spring vetch
<i>Viola canina</i>	heath dog violet
<i>Viola lutea</i>	mountain pansy
<i>Viola palustris</i>	marsh violet
<i>Viola riviniana</i>	common dog violet
<i>Vulpia bromoides</i>	squirrel's tail fescue

Habitat Selection Guidelines

2.2 Woodland, scrub and hedgerows

Woodlands under this section include all broadleaf semi-natural woodland and broadleaf and coniferous plantations on former ancient semi-natural woodland (ASNW) sites. Also included are woodland sites of more recent origin. All hedgerows dominated by native tree and shrub species are also included in this section.

2.2.1 Ancient Woodland

There can be some confusion about the terms used to describe woodland types. Relics of primeval woodland which have continuously occupied the same site since the original wildwood covered the British Isles at the end of the last ice age, are referred to as primary woodland. Although primary woodlands may have been managed for centuries, they have never been clear-felled and replanted and support trees and shrubs native to the sites.

Secondary woodlands are those that have formed on land which was cleared of trees at one time, although this may have occurred many hundreds of years ago. On the basis of its age, woodland may also be classified as ancient or recent. All ancient woodlands date back to medieval times or earlier (pre 1600 A.D in England). In general, recent woodlands are post medieval and although new woodland planting became increasingly common place during the 18th century, the majority of woodland that existed in 1800 is believed to have been primary woodland¹².

All primary woodlands are ancient, whereas secondary woodlands may be ancient or recent. Ancient woodlands generally have richer, more characteristic floras, greater vegetation structure and age class diversity and in general a high nature conservation interest. It is now widely recognised that ancient woodlands support a suite of species, which are confined to older sites.

The term semi-natural woodland refers to woodland comprised of species native to the locality that have not obviously been planted. Ancient and semi-natural woodland is not necessarily the same thing. Ancient refers to the site as woodland over time, whereas semi-natural refers to what is growing on the site.

The most definitive data on the county's ancient woodland resource is the provisional Ancient Woodland Inventory (AWI), but with the exception of the National Parks and Ryedale District, the data is based on Phase 1 surveys of varying quality and Phase 2 surveys only of selected sites. Sites of less than 2 ha are deliberately excluded from the Inventory and as a consequence some small stands of ancient woodland are omitted. The AWI also only provides 'basic data' and does not give any indication of the relative conservation value of individual woods. Data about size and the planted status of separate woodland sites is available, but the three reports that cover North Yorkshire give totals for Craven with Richmond; Ryedale with Scarborough; and Harrogate with Hambleton and Selby. Six of these districts and boroughs overlap considerably with National Parks, where ancient woodlands tend to be concentrated. Data on the area of ancient woodland in North Yorkshire from the AWI provisional reports is presented in Table 9.

The AWI data indicates that in 1993 approximately 1.7% of the total land area of the county was ancient woodland, comprising 1% replanted and 0.7% semi-natural woodland.

Ancient woodlands are generally well distributed outside the National Parks except for the Saltburn to Bridlington coastline, Yorkshire Wolds, Tees Lowlands and Vale of Pickering Natural Areas, which are sparsely wooded. The Humberhead Levels Natural Area is also sparsely wooded, but

¹² Rackham, O. (1980). Ancient Woodland. London. Arnold.

for the large area of Bishop Wood.

Table 9: Ancient Woodland Inventory Area (ha)

	Ryedale & Scarborough	Craven & Richmond	Harrogate, Hambleton, Selby & York	North Yorks
Ancient Semi-Natural Woodland	2,508	1,644	1,640	5,792
Replanted	4,376	773	2,965	8,114
Total Ancient in 1993	6,884	2,417	4,605	13,907
Area cleared since c1900	61	101	259	421

The main concentration of larger ancient woodlands outside of the National Parks is in the southern part of the North York Moors and Hills Natural Area, particularly in the Howardian Hills Area of Outstanding Natural Beauty. Other, more scattered, 'concentrations' of variously-sized ancient woodlands occur in the Southern Magnesian Limestone, Pennine Dales Fringe Natural Areas and the Nidderdale part of the Yorkshire Dales Natural Area. Within the Tees Lowlands Natural Area, the Leven Valley has a localised grouping of mainly broadleaf ancient woodlands that extend into Cleveland County. The eastern fringe of the Forest of Bowland Natural Area has small and scattered ancient woodland sites.

There is no comprehensive data about the area of ancient woodlands within the local planning authority boundaries in North Yorkshire. The woodlands in Ryedale District, however, have been surveyed in detail between 1991 and 1993¹³ and the results are presented in Table 10.

The majority of the ancient woodlands in Ryedale District are concentrated in the North York Moors and Hills Natural Area, with a much smaller extent in the Yorkshire Wolds and very little within the Vale of Pickering and the Vale of York and Mowbray Natural Areas. Total woodland cover was calculated from Phase 1 and Phase 2 surveys as occupying 5.6% of the total land area of the District. Of this, 3.9% was recent woodland and 1.7% was ancient woodland. Ancient semi-natural woodland comprised only 0.28% of the total land area of the District outside the North York Moors National Park.

No woodland of medium to large size has survived intact as ancient semi-natural woodland. The majority of re-planting has involved conifers (mainly larches, spruces and pines), sycamore and beech, as well as native oaks. Shrub layers are generally suppressed or removed, particularly under conifers, and over-mature and veteran trees are uncommon to rare. Nevertheless, many replanted ancient woodlands remain of high conservation value, especially where broadleaf trees predominate.

¹³ Weston, A. (1993). Ryedale ancient woodland Phase II survey. University of York, English Nature.

Table 10: Ancient Woodland in Ryedale District (excluding National Parks)

Phase 1 habitats	Ha	%
Plantation Broadleaf Woodland	572.5	33.4
Plantation Mixed Woodland	473.0	27.6
Plantation Coniferous Woodland	373.0	21.8
Plantation	1418.5	82.8%
Semi-natural Broadleaf Woodland	294.0	17.2
Total	1,712.5	100%

Generally in Ryedale, and North Yorkshire as a whole, the richest woodlands botanically (and in other respects like veteran trees and natural drainage patterns) are 'neglected'. Coppicing has long since declined and species reliant on its niches and cycles have almost certainly declined or become locally extinct.

2.2.2 Woodland and scrub communities

The UK Biodiversity Action Plan includes priority Habitat Action Plans for upland oak woodland, upland mixed ashwoods and wet woodlands, all of which occur in North Yorkshire. Generally speaking there is a very good correlation between the published accounts of woodland communities in the National Vegetation Classification (NVC) and the stand types of North Yorkshire woodlands (A. Weston, *pers. comm.*).

Wet woodlands

The UK Habitat Action Plan describes wet woodland as including NVC community types W1 to W7. These woodlands are found on poorly drained and/or seasonally wet soils with alder, willow and birch species dominating the woodland canopy and understorey.

In North Yorkshire wet woodland occurs in all the local planning authority areas, although the area of such woodlands is unknown, as is the extent of ancient semi-natural wet woodland. The community W1 (*Salix cinerea* - *Galium palustre* woodland) is widespread, usually of small extent and fragmentary in damp hollows and alongside standing or slow-moving water. NVC woodland and scrub communities W2 (*Salix cinerea* - *Betula pubescens* - *Phragmites australis* woodland), W4 (*Betula pubescens* - *Molinia caerulea* woodland) and W5 (*Alnus glutinosa* - *Carex paniculata* woodland) are scarce. W2 and W4 communities are often associated with base-poor peats and fens, and believed to be scarce due to drainage of lowland peat and possible coniferisation. W2 and W4 mainly occur within heathland SSSIs and W4 occurs in fragmentary stands within the Vale of York and the Yearsley Moor area of the Howardian Hills Area of Outstanding Natural Beauty (AONB). W5 communities, however, are mainly associated with waterlogged floodplains. Known W5 sites are all believed to be ancient woodland and are usually semi-natural.

The NVC community W3 (*Salix pentandra* - *Carex rostrata* scrub) is present in both the National Parks, but is only thought to occur in fragmentary stands outside the Parks in areas such as Nidderdale.

The W6 (*Alnus glutinosa* - *Urtica dioica* woodland) community is often dominated by willow species and is generally uncommon and often associated with seasonally wet lowland flood plains. The W7 (*Alnus glutinosa* - *Fraxinus excelsior* - *Lysimachia nemorum* woodland) community has a localised distribution within the county typically situated on upland fringes and around flushes in lowland woods. Often such stands consist of linear fragments within other woodland vegetation or are relicts of larger woods within upland pastures.

Mixed Ash woodlands of neutral to calcareous soils

The principal NVC woodland community dominated by ash with a variety of other tree and shrub species is the W8 (*Fraxinus excelsior* - *Acer campestre* - *Mercurialis perennis* woodland) community. It is the commonest woodland type in North Yorkshire after W10 (*Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus*) woodland and both types commonly occur together in varying proportions. The mixed ash woods, however, are concentrated in limestone areas, although they also occur on calcareous and neutral drift in the vales. The majority of W8 woodland is located within ancient woodland sites, but secondary ash woods colonise unwooded ground on calcareous and neutral soils when allowed.

Ancient lowland ashwood is the richest woodland vegetation in terms of vascular plant diversity. The majority of ancient woodland indicators presented in Table 12 are found in such woodland and many are lime-loving species (calcicoles). Some of the more uncommon plants associated with these woodlands include herb paris (*Paris quadrifolia*), broad-leaved helleborine (*Epipactis helleborine*), toothwort (*Lathraea squammaria*) and some nationally scarce species such as yellow-star-of-Bethlehem (*Gagea lutea*), wood barley (*Hordelymus europaeus*) and baneberry (*Actaea spicata*). In the UK baneberry is restricted to ancient limestone woods and limestone pavements in Yorkshire and more locally in Lancashire and Cumbria. However, there is a significant population in a woodland in the Yorkshire Wolds that is not an ancient woodland site.

Normally, less modified ancient W8 woods have an understorey of hazel (*Corylus avellana*) and wych elm (*Ulmus glabra*), but the most pristine examples also have a higher frequency of southern shrubs, such as field maple (*Acer campestre*), dogwood (*Cornus sanguinea*), spindle (*Euonymus europaeus*) and purging buckthorn (*Rhamnus catharticus*). The majority of ancient ashwoods have the appearance of being secondary regeneration from post-war fellings, as they are relatively young, even aged and their canopies very ash-dominated. Both native oaks would naturally have been more frequent in such woods but have regenerated badly. There is also usually very little over-mature wood.

Outside the National Parks, semi-natural examples of mixed ashwoods are concentrated in Ryedale within the North York Moors and Hills Natural Area, mainly near Pickering and on the perimeter slopes of the Howardian Hills AONB. Ash woodland is also the dominant woodland type in the Southern Magnesian Limestone Natural Area, where the majority is re-planted ancient woodland (often with sycamore, larch, and beech). Although these woods are plantations they often retain significant surviving populations of uncommon calcicolous species.

In the Yorkshire Wolds Natural Area W8 woodlands are mainly modern plantations and are concentrated on the western escarpment. There is, however, a small number of ash woods that are generally dominated by ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and elder (*Sambucus nigra*) with a ground flora dominated by dog's-mercury (*Mercurialis perennis*). Normally carpets of dog's mercury are associated with ancient woodland, but many of these woodlands have impoverished floras more typical of recent woodland. The few coastal examples of W8 ashwoods tend to be moderately species-poor, eutrophic and dominated by sycamore and wych elm.

The other type of mixed ash woodland in North Yorkshire corresponds to the W9 (*Fraxinus excelsior* - *Sorbus aucuparia* - *Mercurialis perennis* woodland) community. Stands of this sub-montane woodland type, however, are rare, fragmentary and believed confined to sheltered valley bottoms and valley heads in the North York Moors and Hills Natural Area.

Oak woodlands of neutral to acidic soils

Lowland oak woodland vegetation is the principal woodland community in North Yorkshire on moist, moderately base-poor, neutral to slightly acid soils. The vegetation corresponds to the W10 (*Quercus robur* - *Pteridium aquilinum* - *Rubus fruticosus* woodland) community, which can also extend into the upland fringes as sub-community W10e (*Acer pseudoplatanus*-*Oxalis acetosella*), where semi-natural stands are most likely to be located.

The majority of W10 woodland, however, is planted, usually with conifers. Sycamore is also often frequent as a result of planting and natural regeneration. Oaks of both native species have also been planted in such woods, particularly in the 19th century and can have an artificial dominance with few other canopy species. Where shrub layers are very suppressed, it is thought that nurse conifer trees may have been planted and later extracted. Where a native understorey of hazel, holly (*Ilex aquifolium*), rowan (*Sorbus aucuparia*) and birches (*Betula spp.*) is present the woodlands are usually considered to be semi-natural.

Heathy oak-birch woodland predominantly of NVC type W16 (*Quercus spp* - *Betula spp* – *Deschampsia flexuosa*) is characteristic of acid, sandy soils and drier, shallower peat. It can regenerate on suitable 'neglected' land anywhere in the county, but it most typically survives or develops on the upland fringes of the Yorkshire Dales, Forest of Bowland and North York Moors and Hills Natural Areas. In the lowland vales, outside SSSIs, this woodland type has been almost totally lost to agriculture and forestry. This habitat tends to be secondary woodland on former heathland, but it can also occur, usually as fragments, within free-draining parts of ancient W10 woodland. These acid woodlands are often dominated by silver and hybrid birches (*Betula spp.*), but older stands are often dominated by sessile oak (*Quercus petraea*) and hybrid oak (*Quercus x rosacea*), with holly and rowan present in less grazed stands.

Although much of these woodlands correspond to the W16 community, transitional stands between W16 and W 17 (*Quercus petraea* - *Betula pubescens* - *Dicranum majus*) woodland and W10 and W11 (*Quercus petraea* - *Betula pubescens* - *Oxalis acetosella*) woodland are thought to occur. This is particularly likely in areas of higher rainfall, humid valley bottoms and shaded ravines.

Vascular plant diversity is generally low in Yorkshire examples of these woodland types, but suitable situations can support rich bryophyte (mosses and liverworts) communities and distinctive fern floras, sometimes at low altitudes. Less common vascular plants in sub-montane situations include lily-of-the-valley (*Convallaria majalis*), common cow-wheat (*Melampyrum pratense*), chickweed wintergreen (*Trientalis europaea*) and beech fern (*Phegopteris connectilis*).

The exact distribution of the upland oak wood NVC communities is unclear, but upland oak woodland is present in North Yorkshire in the local planning authorities of Hambleton, Craven and Ryedale.

Scrub

Scrub communities are a natural component of many habitat types often where past management has lapsed or been reduced. In some circumstances such as coastal situations, or high altitude scrub can be the climax vegetation community. More often scrub is seen as a threat and in some circumstances scrub invasion does need to be controlled in order to protect grassland, heathland or wetland communities. Scrub, however, can be of significant nature conservation in its own right, for example, species-rich scrub on limestone soils. Depending on the stage of development of scrub it can form dense single-species stands or scattered open stands.

The presence of scrub in a grassland, heathland or wetland provides valuable structural variety for a range of animals that would not otherwise occur on a site. This is particularly the case in relation to invertebrate faunas. As a consequence, the maintenance of a balance between open habitats and scrub can be important in maintaining the ecological interest of a site.

Rare scrub communities are included in these guidelines, but other types of scrub community are included under the guidelines relating to habitat mosaics. In addition, scrub is recognised as being an important component of grassland, heathland and wetland communities and as such the guidance on determining boundaries of SINCs allows for the inclusion of stands of scrub associated with these broad habitat types.

Some types of scrub are of special conservation interest in North Yorkshire due to their rarity, their importance for communities of specialised invertebrates or their contribution to habitat mosaics in particular landscapes. Of these, juniper (*Juniperus communis*) has long been restricted to a few small populations in the most rugged and remote parts of the north-east and north-west of the County. It is very unlikely to occur outside the National Parks but, given the precarious status of English populations (Plantlife International, 2004), even single native bushes would be important in a County context. Bog myrtle (*Myrica gale*) has probably been declining in the Yorkshire lowlands since the drainage and enclosure of peaty commons began (e.g. Howes, 2000); it is unlikely to be found outside two or three SSSIs.

Two scarce northern willows, tea-leaved willow (*Salix phylicifolia*) and dark-leaved willow (*S. myrsinifolia*), occur very locally in the County, primarily on the Carboniferous limestone. Within the Yorkshire Dales National Park, these willows provide patchy scrub cover along limestone gills and probably provide a valuable source of nectar and pollen in spring. It is unclear whether recognisable stands, as opposed to individual plants, occur outside the National Parks but any such examples would merit SINC status. Although eared willow (*Salix aurita*) is much more widespread nationally, stands of this species may be equally significant on more acidic moorland-fringe soils. However, we have insufficient data to determine whether this is a 'County rare' vegetation type. Consequently it is recognised as a significant component of mixed habitats (Section 2.10 of these Guidelines). Similar significance is afforded to aspen (*Populus tremula*) stands and species-rich woodland/scrub edge vegetation (sometimes referred to using the Continental term *saum*).

Of more clear-cut importance are naturally-occurring thickets and pioneer woodland communities of exposed riverine sediments. These are characterised by native willows, with *Salix purpurea* apparently being frequent, as opposed to the widely planted or naturalised *S. fragilis* and *S. viminalis*. These communities are specifically associated with sand, gravel and shingle deposits on meander bends, shoals and 'batts' (islands) in actively eroding and depositing rivers such as the middle reaches of the Tees, Swale and Ure. There is usually a distinct woodland component to the herb layer flora including, for example, *Allium* species, yellow star-of-Bethlehem (*Gagea lutea*) and giant bellflower (*Campanula latifolia*). From the limited data available, such habitats are of exceptional entomological interest (e.g. Crossley, 2000) and may also be important for Otter and various wet woodland birds. Riparian woodlands more extensively dominated by canopy trees should be assessed using the woodland guidelines.

Species-rich thorn scrub is also rare in North Yorkshire with a small number of examples known from the magnesian limestone belt and, in Harrogate district, calcareous alluvial substrates. Similar vegetation could potentially occur also on the chalk and Jurassic limestone. Such communities are characterised by the occurrence of various calcicole shrubs, small trees and climbers alongside more ubiquitous scrub dominants and equate to a northern version of the *Viburnum lanata* subcommunity of hawthorn scrub described in the NVC as W21d. Although invasive in a few places, burnet rose (*Rosa spinosissima*) underscrub is a rare component of species-rich scrub on and adjoining the magnesian limestone.

2.2.3 Hedgerows

Few surveys of the hedgerows of North Yorkshire have been undertaken, but nationally and within North Yorkshire hedgerows have been lost at a steady rate over the last 50 years. In North Yorkshire the Countryside Agency estimate that in 1990 there was approximately 18,000 kilometres of hedgerow, however, the proportion of this total that is comprised of ancient or species-rich hedgerows is unknown. According to the UK Habitat Action Plan it could be surmised that approximately 42% of all hedges are ancient and/or species-rich, although it is recognised that there is likely to be a concentration in southern England and Wales.

Ancient hedgerows are taken as those that were in existence prior to the Enclosures Acts which were passed primarily between 1720 and 1840. Most ancient hedgerows support a good diversity of woody plant species (e.g. hazel, field maple, wych elm and dogwood) and often a ground flora with ancient woodland indicators. They also can be associated with physical features such as parish

boundary ditches and banks and are common along country lanes. By contrast enclosure hedges tend to comprise few species such as hawthorn, blackthorn and elder and are less associated with particular physical features.

Hedgerows are important for a wide range of common and rare species and are especially valuable habitat for farmland birds, bats, moths and butterflies. It is also recognised that as linear habitats they can act as links between areas of semi-natural habitat, encouraging movement and dispersal for some species through what is generally an intensively managed landscape.

2.2.4 Selection Criteria and Attributes

Table 11 Selection criteria and attributes for woodland SINC

CRITERION	ATTRIBUTE
Size	Area of site (ha) or length of hedgerow
Diversity	Number of recorded vascular plant species. This also reflects habitat diversity.
Naturalness	Diversity of tree and shrub species per length of hedgerow. Presence of semi-natural/unplanted (AWI & Phase 1 criteria); AWI listed; number and/or cover ancient indicator species; presence and cover/number of native coppice/over-mature native trees. Presence of native veteran trees.
Rarity	Presence of nationally or regionally uncommon vegetation types. Presence of significant populations of bluebell.
Representativeness	Presence of habitat and/or species characteristic of county or Natural Area
Position in an ecological unit	Proximity to other sites or position in wildlife corridor.
Recorded history	Presence of historic documentation and cartographic evidence of ancient woodland or continuity of semi-natural woodland cover.

2.2.5 Woodland Selection Guidelines

Sites that meet one or more of the following guidelines will be eligible for designation as a SINC.

Guideline

Wd1

Ancient semi-natural woodland of 0.5ha or more in size.

Application

This guideline is to be applied to woodland sites that meet the definition of Ancient Semi-Natural Woodland (ASNW) as defined in the Ancient Woodland Inventory (AWI) for North Yorkshire i.e. sites believed to be under continuous woodland cover since 1600 supported by mapped evidence. The survival of ancient features should be evident, such as the presence of banks or ditches. Historical evidence of the woodland from reliable map data is essential. Those sites that have been felled and ploughed or converted to an alternative land-use other than woodland, and have not retained some of their ancient features, should be considered under other guidelines in this section. This is not restricted to ASNW listed within the North Yorkshire AWI alone as not all ancient woodland sites were checked with field survey at the time of the production of the Ancient Woodland Inventories, hence the North Yorkshire Inventories are regularly updated as field evidence becomes available. In addition the AWI only considers sites over 2ha in size. Only sites for which there is reliable site survey information prior to the time of designation as a SINC will be confirmed as SINC.

Rationale

Ancient Woodland sites are those where there has been woodland cover for many hundreds of years if not dating back to the clearance of the original wild wood that once covered much of the British Isles. This guideline reflects the importance of the ecological continuity of such woodlands and the scientific value of ancientness, as once lost it cannot be replaced. The soil resource including the soil biota is long established and the lack of general disturbance such as ploughing or grazing all indicates longevity. Ancient semi-natural woodlands have not stood untouched throughout this time, but have been traditionally managed or neglected at intervals and to various degrees throughout their history. They all, however, have remained as woodland or scrub; or if converted to an alternative land-use, this has occurred many hundreds of years ago (pre 1600) and such sites have subsequently become re-colonised by species with a strong affinity to ancient woodlands. In North Yorkshire ancient semi-natural woodlands are generally uncommon except in several valleys within the National Parks. They represent some of the most natural habitat in the county, often with a high diversity of plant and animal groups. Ancient woodlands are estimated to occupy only 1.7% of the area of North Yorkshire and less than a third of the ancient woodland area remains today as ancient semi-natural woodland, mainly within the National Parks with the majority having been re-planted.

Guideline

Wd2

Stands of semi-natural woodland or scrub larger than 0.25ha that are assigned to the following NVC communities:

- W2** *Salix cinerea-Betula pubescens-Phragmites australis* woodland
- W3** *Salix pentandra-Carex rostrata* woodland
- W4** *Betula pubescens-Molinia caerulea* woodland
- W5** *Alnus glutinosa-Carex paniculata* woodland
- W9** *Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis* woodland
- W11** *Quercus petraea-Betula pubescens-Oxalis acetosella* woodland
- W17** *Quercus petraea-Betula pubescens-Dicranum majus* woodland

Or

**Areas of 1.0ha or more of semi-natural woodland assigned to NVC type W16
Quercus spp.-Betula spp- Deschampsia flexuosa woodland.**

Application

This guideline will be applied to stands of semi-natural woodland that has been identified as supporting the NVC communities listed above. The definition of the site boundary will be a recognisable management unit usually using contours or woodland coups as the NVC community stands are likely to lie within larger woodlands. A competent surveyor should base the woodland community classification on field assessment.

Rationale

These woodland communities represent types of vegetation that are rare, fragmented and transitional within the county and should be provided appropriate protection.

Guideline

Wd3

Woodland sites of 0.5 hectare or more that support field evidence of features of ancient or long standing wet or dry woodland. Field evidence includes:

- (a) If it is an acidic woodland a score of 8 or more derived from the species listed on Table 13 (also see b).**
- (b) If it is an acidic woodland within the Vale of York & Mowbray, Vale of Pickering, Yorkshire Wolds or Humberhead Levels Natural Areas a score of 5 or more derived from the species listed in Table 13.**
- (c) If it is a neutral to calcareous woodland a score of 12 or more from the species listed in Table 12.**
- (d) If it is a wet woodland or scrub community a score of 10 or more derived from the species listed in Table 14.**

Application

This guideline will apply to all areas of semi-natural woodland not listed on the Ancient Woodland Inventory and to plantations (broadleaf and coniferous). Wd3(d) will probably apply to good quality examples of NVC community types that are more widespread, than those cited in Wd2, such as W1, W6 and W7. These wet woodland sites may be linear riverine woodlands. In sites with a replanted coniferous or broadleaf stand, indicator species in Tables 12, 13 or 14 should occur throughout the body of the wood and not be just restricted to the boundaries.

Rationale

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

Guideline

Wd4

Areas of woodland that support:

Eighty or more species of unplanted native woodland vascular plants
or
Eight or more species of fern.
or
Five or more veteran trees.

Application

This guideline can be applied to all areas of semi-natural and plantation woodland.

Rationale

The characteristics selected in this guideline represent valuable specific features of woodlands in North Yorkshire reflecting the criteria of rarity, diversity and naturalness. Old and over mature trees are very valuable wildlife habitats providing habitat for a wide variety of mammals, birds, invertebrates and plants.

Guideline

Wd5

Bluebell woodlands (usually NVC W10, sometimes W11, W8b or W8e) greater than 0.5 ha with a NVC random quadrat constancy for bluebell of III or over and a ground cover by bluebells of 40% or greater in at least 10% of the woodland area.

Application

This guideline should be applied to all woodlands.

Rationale

The UK supports a significant proportion of the European population of bluebell and, as such, has a particular duty to ensure the survival of this species through the protection of bluebell woodland habitat.

Guideline

Wd6

Semi-natural woodlands of 0.5 ha or more that have a score from Tables 12, 13 or 14 within 20% of the thresholds for any of the different woodland types and which adjoins, or lies within half a kilometre of an existing woodland statutory designated site or SINC.

Application

This guideline can be applied to any woodland site which does not meet any of the above guidelines which is within a recognised wildlife corridor or is within close proximity to an existing woodland statutory site or SINC that has been designated for its woodland habitat. Two or more sites which are within 20% of the thresholds listed in other Wd Guidelines within 500 metres of each other, but not within 500 metres of a woodland statutory site or SINC should not be designated.

Rationale

The role and importance of linear continuous habitats and blocks of habitat which act as stepping stones or patches of habitat has been well studied in relation to population dynamics and rates of extinction, immigration and emigration of individuals of species from one habitat patch to another. As a consequence the importance of linear habitats in the countryside and urban areas is recognised in planning policy guidance PPG9 and the EU Habitats Directive.

Guideline

Wd7

A hedgerow that is at least 50 metres in length, originates from the pre Enclosure Acts period and supports;

- (a) 10 or more species of native trees and/or shrubs, or
- (b) if it supports 8 or more native tree and shrubs species; and has a score of 5 or more for non-woody species listed in Table 12, or
- (c) supports 5 or more veteran trees or
- (d) is an ancient woodland “ghost” hedge

Application

This guideline can only be applied to hedgerows thought to originate from the pre-Enclosure Acts period. Determination of the origin of a hedge can be based on map evidence and, if no map evidence is available, from field evidence that indicates the hedgerow is ancient (i.e. pre-enclosure). Guidance is given in the Hedgerows Regulations 1997¹⁴ on relevant documents which can be used to determine ‘pre-Enclosure Acts hedgerows’, including estate maps, tithe maps and awards, various enclosure maps, charters and manorial records. The identification of a hedgerow length should follow the guidance given in the Hedgerow Evaluation and Grading system¹⁵. Consideration should be made of the general distribution of different tree and shrub species throughout the hedgerow when determining the designation of a SINC. A “ghost” hedge is defined as a linear strip of ancient woodland that has hedgerow dimensions (Andrew Weston, *pers. comm.*).

Rationale

Hedgerows originating from pre-Enclosure Acts periods are considered as ancient hedgerows by the UK Habitat Action Plan for Hedgerows. They are likely to support a good diversity of plant and animal species and are long established habitats in the landscape. Many may be remnants of ancient woodland and as such cannot be replaced once lost. Old and over-mature trees are invaluable wildlife habitats providing habitat for a wide variety of mammals, birds, invertebrates and plants.

Guideline



A hedgerow or hedgerows, which connect SINCs which are 0.5km or less apart and support 5 or more tree and shrub species and/or have a score of 5 or more for non-woody species listed in Table 12, 13 or 14.

Application

This guideline can be applied to any hedgerow whether pre-Enclosure Acts or not. The hedgerow(s) should be more or less continuous and there should be no gaps in the hedgerows greater than 10 metres. If there is a series of gaps each less than 10 metres, but accounting collectively for more than 40% of the line of the hedge, it should not be selected.

Rationale

Hedgerows are recognised as important habitats in their own right for a range of plant and animals species, and also as linear habitats that aid the dispersal and distribution of species throughout the countryside. Hedges or combinations of hedges connecting SINC quality woodland blocks are more likely to support a diverse range of species and help to provide direct physical connections between fragments of woodland.

Guideline

¹⁴ HM Government (1997). The Hedgerow Regulations 1997. A guide to the law and good practice. HMSO.

¹⁵ Clements, D.K and R.J Tofts (1992). Hedgerow evaluation and grading scheme (HEGS): A method for ecological survey, evaluation and grading of hedgerows. Countryside and Management Planning.

Wd9

Any stands of the following types of scrub communities:

- a) Juniper (*Juniperus communis*)
- b) Bog myrtle (*Myrica gale*)
- c) Upland willow scrub on calcareous substrates, with tea-leaved willow (*Salix phyllicifolia*), dark-leaved willow (*S. myrsinifolia*) or associated hybrids
- d) Willow scrub on exposed riverine sediments, including banks, islands and shorelines of dynamic rivers
- e) Species-rich thorn scrub normally corresponding to the *Viburnum lanata* subcommunity of *Crataegus monogyna* – *Hedera helix* scrub coded W21d in the NVC containing three or more of the following species:
 - i. spindle (*Euonymus europaeus*)
 - ii. wild privet (*Ligustrum vulgare*)
 - iii. purging buckthorn (*Rhamnus catharticus*)
 - iv. dogwood (*Cornus sanguinea*)
 - v. burnet rose (*Rosa spinosissima*)
 - vi. wild clematis (*Clematis vitalba*)

Application

This guideline can be apply to any naturally-occurring example of the above communities but does not cover stands of planted origin, hedgerows or woodland-edges. Bushes or small trees should comprise >25% cover of the designated area, with less than 25% cover of canopy trees. In the case of juniper, even single bushes could be considered for designation since they may be valuable in maintaining genetic diversity. For juniper, site boundaries should be defined to take account of the ecological requirements of the plant (including bare or sparsely-vegetated ground for seedling establishment, perches for frugivorous birds which distribute the seeds etc).

Rationale

These types of scrub are rare in North Yorkshire and important to conserve both in their own right and as habitats for their associated fauna.

Table 12 Vascular indicator plants of neutral to calcareous woodlands in North Yorkshire.

Scientific name	Common name
<i>Acer campestre</i>	Field maple
<i>Actaea spicata</i>	baneberry
<i>Adoxa moschatellina</i>	Moschatel
<i>Allium ursinum</i>	Ramsons
<i>Anemone nemorosa</i>	wood anemone
<i>Aquilegia vulgaris</i> +	columbine
<i>Campanula latifolia</i>	giant bellflower
<i>Carex pallescens</i>	pale sedge
<i>Carex pendula</i>	pendulous sedge
<i>Carex remota</i>	remote sedge
<i>Carex strigosa</i>	starved wood sedge
<i>Carex sylvatica</i>	wood sedge
<i>Chrysosplenium alternifolium</i>	alternate-leaved golden saxifrage
<i>Chrysosplenium oppositifolium</i>	opposite-leaved golden saxifrage
<i>Convallaria majalis</i> +	lily of the valley
<i>Cornus sanguinea</i> +	dogwood
<i>Daphne laureola</i>	spurge laurel
<i>Epipactis helleborine</i>	broad leaved helleborine
<i>Euonymus europaeus</i> +	spindle
<i>Festuca altissima</i>	wood fescue
<i>Frangula alnus</i>	alder buckthorn
<i>Gagea lutea</i>	yellow-star-of-Bethlehem
<i>Galium odoratum</i>	sweet woodruff
<i>Geranium sylvaticum</i>	wood crane's-bill
<i>Hordeylmus europaeus</i>	wood barley
<i>Hyacinthoides non-scripta</i>	bluebell
<i>Lamiastrum galeobdolon ssp. montanum</i>	yellow archangel
<i>Ligustrum vulgare</i>	wild privet
<i>Luzula pilosa</i>	downy woodrush
<i>Luzula sylvatica</i>	great woodrush
<i>Lysimachia nemorum</i>	yellow pimpernel
<i>Melica nutans</i>	mountain melick
<i>Melica uniflora</i>	wood melick
<i>Mercurialis perennis</i>	dog's mercury
<i>Milium effusum</i>	wood millet
<i>Neottia nidus-avis</i>	bird's-nest orchid
<i>Orchis mascula</i>	early-purple orchid
<i>Oxalis acetosella</i>	wood sorrel
<i>Paris quadrifolia</i>	herb paris
<i>Phyllitis scolopendrium</i>	hart's tongue fern
<i>Platanthera chlorantha</i>	greater butterfly orchid
<i>Polystichum aculeatum</i>	hard shield fern
<i>Polystichum setiferum</i>	soft shield fern
<i>Primula vulgaris</i>	primrose
<i>Prunus padus</i> +	bird cherry
<i>Pyrola minor</i>	common wintergreen
<i>Ranunculus auricomus</i>	goldilocks buttercup
<i>Rhamnus catharticus</i>	buckthorn
<i>Sanicula europaea</i>	sanicle
<i>Tilia cordata (ancient)</i> +	small-leaved lime
<i>Veronica montana</i>	wood speedwell
<i>Vicia sylvatica</i>	wood vetch
<i>Viola reichenbachiana</i>	early dog violet

Table 13. Vascular indicator plants of acid woodland in North Yorkshire

Scientific name	Common name
<i>Anemone nemorosa</i>	wood anemone
<i>Blechnum spicant</i>	hard fern
<i>Calluna vulgaris</i>	ling heather
<i>Carex binervis</i>	green-ribbed sedge
<i>Ceratocapnos claviculata</i>	climbing corydalis
<i>Chrysosplenium oppositifolium</i>	opposite-leaved golden saxifrage
<i>Convallaria majalis</i> +	lily-of-the-valley
<i>Corylus avellana</i>	hazel
<i>Frangula alnus</i>	alder buckthorn
<i>Gymnocarpium dryopteris</i>	oak fern
<i>Hyacinthoides non-scripta</i>	bluebell
<i>Lonicera periclymenum</i>	honeysuckle
<i>Luzula pilosa</i>	hairy wood-rush
<i>Luzula sylvatica</i>	great wood-rush
<i>Lysimachia nemorum</i>	yellow pimpernel
<i>Melampyrum pratense</i>	common cow wheat
<i>Oreopteris limbosperma</i>	lemon scented fern
<i>Oxalis acetosella</i>	wood sorrel
<i>Phegopteris connectilis</i>	beech fern
<i>Polypodium vulgare</i>	common polypody
<i>Pyrola minor</i>	common wintergreen
<i>Quercus petraea</i>	sessile oak
<i>Salix aurita</i>	eared willow
<i>Teucrium scorodonia</i>	wood sage
<i>Trientalis europaea</i>	chickweed wintergreen
<i>Vaccinium myrtillus</i>	bilberry

Key to tables 12 and 13:+ not obviously/recently planted. Species in **bold** score 2.

Table 14. Vascular indicator plants of wet woodlands in North Yorkshire

Scientific name	Common name
<i>Adoxa moschatellina</i>	Moschatel
<i>Allium ursinum</i>	Ramsons
<i>Anemone nemorosa</i>	wood anemone
<i>Angelica sylvestris</i>	wild angelica
<i>Apium nodiflorum</i>	fool's watercress
<i>Athyrium filix-femina</i>	lady fern
<i>Berula erecta</i>	lesser water parsnip
<i>Calamagrostis canescens</i>	purple small-reed
<i>Caltha palustris</i>	marsh marigold
<i>Campanula latifolia</i>	giant bellflower
<i>Cardamine amara</i>	large bittercress
<i>Carex acuta</i>	slender tufted sedge
<i>Carex acutiformis</i>	lesser pond sedge
<i>Carex elata</i>	tufted sedge
<i>Carex laevigata</i>	smooth-stalked sedge
<i>Carex nigra</i>	common sedge
<i>Carex paniculata</i>	greater tussock sedge
<i>Carex pendula</i>	pendulous sedge
<i>Carex remota</i>	remote sedge
<i>Carex riparia</i>	greater pond sedge
<i>Chrysosplenium alternifolium</i>	alternate leaved golden saxifrage
<i>Chrysosplenium. oppositifolium</i>	opposite leaved golden saxifrage
<i>Crepis paludosa</i>	marsh hawk's-beard
<i>Dryopteris affinis ssp borrieri</i>	scaly male-fern
<i>Dryopteris carthusiana</i>	narrow buckler fern
<i>Equisetum fluviatile</i>	water horsetail
<i>Equisetum sylvaticum</i>	wood horsetail
<i>Equisetum telmateia</i>	giant horsetail
<i>Erica tetralix</i>	cross-leaved heath
<i>Eupatorium cannabinum</i>	hemp-agrimony
<i>Frangula alnus</i>	alder buckthorn
<i>Geum rivale</i>	water avens
<i>Hydrocotyle vulgaris</i>	marsh pennywort
<i>Iris pseudacorus</i>	yellow flag iris
<i>Lamiastrum galeobdolon ssp.montanum</i>	yellow archangel
<i>Lycopus europaeus</i>	gypsywort
<i>Lychnis flos-cuculi</i>	ragged robin
<i>Lysimachia nemorum</i>	creeping jenny
<i>Lysimachia thyrsoiflora</i>	tufted loosestrife
<i>Mercurialis perennis</i>	dog's mercury
<i>Molinia caerulea</i>	purple moor grass
<i>Myosotis laxa ssp. caespitosa</i>	tufted forget-me-not
<i>Myosotis scorpioides</i>	water forget-me-not
<i>Myosotis secunda</i>	creeping forget-me-not
<i>Oenanthe crocata</i>	hemlock water-dropwort
<i>Oxalis acetosella</i>	wood sorrel
<i>Paris quadrifolia</i>	herb paris
<i>Phragmites australis</i>	common reed
<i>Primula vulgaris</i>	primrose
<i>Ranunculus flammula</i>	lesser spearwort

Table 14 (cont.) Vascular indicator plants of wet woodlands in North Yorkshire

Scientific name	Common name
<i>Scirpus sylvaticus</i>	wood club-rush
<i>Stellaria alsine</i>	bog stichwort
<i>Stellaria neglecta</i>	great chickweed
<i>Stellaria nemorum</i>	wood stichwort
<i>Thalictrum flavum</i>	common meadow-rue
<i>Valeriana dioica</i>	marsh valerian
<i>Valeriana officinalis</i>	common valerian
<i>Viburnum opulus</i>	guelder rose
<i>Viola palustris</i>	marsh violet (N.B. score 1 in uplands)

Key: + not obviously/recently planted. Species in **bold** score 2.

Habitat Selection Guidelines

2.3 Parkland, wood pasture and scattered trees

Parklands and wood pasture habitats develop as the result of historic land management, and in many cases landscape design. Such sites may once have been royal hunting forests, wooded pastures or commons, and semi-formal parkland associated with large country houses. These sites often comprise a combination of large, old and veteran standard trees, as scattered specimens, and high forest woodland blocks with a mixture of grazed grassland or heathland. In some circumstances, the parkland or wood pasture may also include ornamental or natural standing water bodies and flowing water habitats.

In parkland the combination of habitats and the presence of old and veteran trees provide a variety of habitat mosaics and a diversity of structure that support a wide range of species. The close geographical proximity of a range of habitats, including hard structures such as buildings and walls, provide habitat corridors, links, mosaics and stepping stones for species activity, movements, food and shelter.

In North Yorkshire there is a wealth of parkland scattered throughout much of the county. There are 28 parkland sites recognised by English Heritage as nationally important designed landscapes and which are listed under the English Heritage Register of Parks and Gardens of Special Historic Interest in England. In 1995, the University of York completed a comprehensive review exercise of further historic parks and gardens on behalf of English Heritage¹⁶. This study focussed upon sites that could be considered for additions to the national Register, examining historical land use, management and features of importance in the context of the landscape of North Yorkshire. From this review, characteristic features of parkland sites can be seen to include combinations of:

- Woodland with old and/or veteran trees
- Walled gardens
- Mature tree belts
- Pasture with/without scattered old or veteran trees
- Tree lined avenues
- Scattered trees
- Hedgerows
- Plantations including exotic species
- Arboretums
- Topiary
- Shrubberies
- Ponds
- Becks
- Streams
- Ha-has
- Lakes
- Estate buildings
- Brick and/or stone walls
- Ice houses

¹⁶ University of York (1995). English Heritage Register of Historic Parks and Gardens of special historic interest in England; North Yorkshire Review Exercise. University of York.

All these features have potential ecological significance for the habitats and species they can support. Detailed ecological data, however, is incomplete for many of these sites. It is evident that parkland contributes significantly to the level of tree cover in certain parts of the county, such as The Vale of York and Mowbray and the Vale of Pickering Natural Areas. Potential threats to these areas include a change in land use practice from pasture to arable uses, which could lead to the direct felling of old and veteran trees and indirect losses through drainage. It is important that further ecological studies are undertaken to enable consideration of SINC designation for the best examples.

Similarly, historic wood pasture sites provide habitat mosaics and structural diversity, which contribute to their ecological value. Such sites may still be managed using traditional methods, but for many sites such management has now lapsed. Wood pasture supports combinations of currently grazed or ungrazed grassland with characteristic features such as old or veteran trees, pollards and evidence of timber management for young wood. As a result, both parkland and wood pasture sites can support distinctive and important assemblages of fungi, epiphytic ferns, bryophytes and lichens, invertebrates associated with deadwood, bats and birds.

There are few known remnants of wood pasture remaining within North Yorkshire, although in Domesday England it was one of the most widespread forms of medieval land-use. Between the 13th and 18th centuries wood pasture was a significant feature of the Nidderdale landscape. Muir (1998) recently discovered an intact enclosure of wood pasture on the interfluvium between Nidderdale and Wensleydale.¹⁷ Of nearly 200 ancient trees surveyed within Nidderdale, however, the majority have been found to be growing along relict or existing field boundaries, often within large estates rather than specific relicts of wood pasture. These historic land uses have led to a significant veteran tree resource within Nidderdale.

Great Britain probably holds a high proportion of veteran trees in Europe and, therefore, all veteran trees are important for nature conservation.¹⁸ The historical continuity and management of parkland and wood pasture habitats not only provides an important setting for veteran trees now, but also significant potential for future veteran trees to grow. The ecological habitat value of old and veteran tree populations is often great, for example within avenues. This is because there are more ecological habitat niches available and they are more likely to support viable long-term populations of associated species and habitats. Trees in avenues and in groupings are particularly valuable. New plantings adjacent to existing veterans provide a good opportunity for species colonisation and movement between trees.

The Veteran Trees Initiative (VTI) has recently produced a book regarding all aspects of veteran trees and their management.¹⁹ In this publication a veteran tree is “*defined as a tree that is of interest biologically, culturally or aesthetically because of its age, size or condition.*” This includes trees that are in the ancient stage of their life and trees which are old relative to other specimens of the same species. There are various types of veteran trees, which are differentiated according to management practice - past or present. The VTI indicate that veteran trees are characterised by the presence of features such as:

- large girth for the species concerned,
- major trunk cavities or progressive hollowing,
- naturally forming water pools,
- decay holes,
- physical damage to trunk,
- bark loss,

¹⁷ Richard Muir (1998) Pollards in Nidderdale: Pollards in Nidderdale: a landscape history. *Rural History; Economy, Society, Culture* **11(1)**: 95-112

¹⁸ David Clayden, English Nature *pers.comm.*

¹⁹Helen Read (2000). *Veteran Trees - A guide to good management.* English Nature.

- large quantity of dead wood in the canopy in damp, shady and dry, open conditions,
- sap runs,
- crevices in the bark, under branches or on the root plate sheltered from direct rainfall,
- fungal fruiting bodies (e.g. from heart rotting species),
- high number of interdependent wildlife species,
- epiphytic plants,
- an “old” look,
- high aesthetic interest,
- heart rot.

The VTI guide is an essential aid in the determination of veteran and old trees. Age alone is not a sufficient criterion.

There are significant numbers of veteran trees in North Yorkshire, the majority of which lie within the setting of parkland or former parkland.

2.3.1 Selection Criteria and Attributes

Table 15 Selection criteria and attributes for parkland and wood pastures SINCs

CRITERION	ATTRIBUTE
Size	Area of site (ha)
Rarity	Presence of rare saproxylic fungi ²⁰ Presence of saproxylic invertebrates found which are listed in the Index of Ecological Continuity. ^{21 22 23} Presence of lichens found listed in the Revised Index of Ecological Continuity ^{24 25}
Diversity	Diversity of habitats (number of habitats and structural diversity) within the site and/or species groups. Number of veteran trees and quantity of standing & fallen dead-wood material Availability of varied nectar sources
Naturalness	Presence of native veteran trees Absence of ploughing and/or fertiliser input Absence of intensive grazing
Representativeness	Presence of habitat and/or species characteristic of parkland & wood pasture Presence of habitat and/or species characteristic of the county or Natural Area
Position in an ecological unit	Proximity of site to other SINCs or within a wildlife corridor Proximity of site to other semi-natural habitats Location of site in relation to other sites supporting veteran trees
Recorded history	Presence of historic documentation and cartographic evidence of past land-use. Presence of ancient woodland.

²⁰ Ted Green. Index in prep.

²¹ Alexander, KNA. (1988). The development of an Index of Ecological Continuity for deadwood associated beetles. In: Welch, RC (ed) Invertebrate indicators of ancient woodland (East Region Regional News) Antenna 12: 69-71.

²² Harding, PT & Alexander, KNA. (1993) The Saproxylic Invertebrates of Historic Parklands: Progress and Problems. In: xxx (eds) Kirby & Drake (1993).

²³ Harding, PT & Alexander, KNA. (1994). The use of Saproxylic Invertebrates in the Selection and Evaluation of Areas of Relic Forest in Pasture-Woodlands. British Journal of Entomological Natural History, 7 (Suppl), pp21-26.

²⁴ Rose, F. (1976). Lichenological indicators of age and environmental continuity in woodlands. In (eds) Brown, DH, Hawksworth, DL & Bailey, RH. (1976) Lichenology: progress and problems. pp279-307. London, Academic Press.

²⁵ Harding & Rose 1986. Pasture woodlands in lowland Britain. Huntingdon, Institute of Terrestrial Ecology.

2.3.2 Parkland, wood pasture and scattered trees selection guidelines

Sites will be eligible for selection as a SINC if they meet either of the following guidelines.

Guideline

Pk1

Parkland or wood pasture sites greater than 5 ha that support habitats and species traditionally associated with parkland or wood pasture and/or support blocks, groupings or scattered old or veteran trees in combination with either grazed woodland or grassland.

Application

This guideline can be applied to historic parkland and wood pasture sites with a combination of habitat types. These should include veteran and/or old trees, at densities of two or more per hectare, and additional habitat features such as watercourses, lakes, dead wood (lying or standing), grazed or ungrazed grassland, woodland and old walls supporting various lichens. Additional interest should also be present such as dead wood invertebrates, fungi, bats, other mammals and/or birds. Parkland sites, in part or wholly, could also be identified under other habitat specific guidelines or the species guidelines.

The determination of veteran or old trees should be relative to the species concerned and in accordance with the definitions and features specified within the publication *Veteran Trees: a guide to good management*.

This habitat guideline does not apply to sites which are significantly altered, such as those parklands in primarily arable uses or sites that support heavily improved grassland and a large number of non-native trees. Trees can also be considered under Pk2.

Rationale

Parkland is a localised habitat and can support some of the oldest surviving trees in North Yorkshire. Parkland supports habitat mosaics and diversity, which does not occur widely in the county, providing suitable conditions for a wide range of plant and animal species.

Guideline

Pk2

Groupings (normally 5 or more) of comparatively old (normally 100 years +) and/or veteran broad-leaved trees in former parkland or wood pasture or similar sites and known to support fungi and/or invertebrates and/or lichens which are either characteristic or specialist species of veteran trees.

Application

This guideline will normally be applied to groupings of native and non-native trees. These may be historically important avenues or as other planting patterns. Traditional woodland management practices such as pollarding may have been employed. It should not be applied to hedgerow trees (see Wd7 & Wd8). The presence of recorded species groups indicates the value of the ecological habitats the tree(s) provide. Trees can also be designated under the species guidelines, in addition to, or independently of these habitat guidelines. In exceptional circumstances, an individual veteran tree of significant importance may also be designated. A single veteran tree would need to be of ecological, aesthetic and cultural value to warrant such an exception.

Rationale

Veteran and old trees are a rare habitat in North Yorkshire and small groupings can support a significant and important variety of plant and animal species. Groupings of these trees generally have a higher ecological value due to the presence of a greater diversity of habitat niches, which in turn are more likely to support viable species populations and are generally less threatened by change than an individual tree.

Habitat Selection Guidelines

2.4 Fens, lowland mires, springs & flushes

The terminology surrounding wetland habitats can be confusing depending on different definitions of terms such as 'fen', 'swamp', 'mire' and 'marsh' (see glossary). Swamp habitats are included in the standing and flowing water selection guidelines because they are normally associated with open water. Marsh covers a range of circumstances and is often found in combination with fen and grassland. Marsh habitats typically support species of periodically waterlogged soils, but with a water table that falls below the soil surface in the summer months. These communities whilst often associated with the edge of fen habitats, are often managed, and referred to as grasslands, but technically have been clarified as mire communities. As such, these communities are covered by these selection guidelines.

Fens are characterised by a summer water table at or just below the sediment surface, but which increases periodically leading to flooding or waterlogging of the land surface. Owing to the high water table there is suppression of organic matter decomposition and the potential for the accumulation of partially decomposed or undecomposed organic material (peat).

Fens receive water and nutrients from rainfall, soil and groundwater. They are comprised predominantly of herbaceous vegetation, although small shrubs may occur and many sites will contain an element of scrub or wet woodland. Unlike swamps, the vegetation comprises mixtures of species in which tall grasses and sedges may be abundant but do not form extensive mono-dominant stands. Fens occupy a range of habitats from the margins of open water to relatively well-drained sites, where humid conditions are maintained by seepages, flushes or groundwater.

Two types of fen can be broadly distinguished based on water movement. Topogenous fens are those where water movements are primarily up and down within the soil. Soligenous fens are those where the water moves primarily laterally over the surface and through the upper soil profile. Fens have also been categorised based on their nutrient and base status as 'poor-fens' and 'rich-fens'.

Grasses and/or tall forbs or species of rush often dominate the vegetation communities of lowland mires. The soils are often waterlogged during the winter months, but the water table falls below the soil surface during the summer enabling the vegetation to be grazed or even cut. They can occur in locations irrigated by base-poor and base-rich water.

2.4.1 Poor-fens and lowland acid mires

Poor-fens and lowland acid mires occur on geological formations, such as sandstone and granite, and on surface deposits that give rise to base-poor substrates. These habitats will also occur in situations where the ground is irrigated by nutrient-poor waters. They support low-growing vegetation irrigated by acid water of low nutrient status. These habitats tend to occur in upland areas or in association with lowland heath and acid grassland, and range from marginally acidic rush-pastures to *Sphagnum* (bog moss) mires. Separate guidelines apply for upland blanket bogs and there are no lowland raised bogs in the local authority area of the county of North Yorkshire.

2.4.2 Rich-fens and lowland mires

Rich-fens are generally irrigated with base-rich waters and are predominantly lowland in distribution or, if in upland or sub-montane situations, they are usually associated with base-rich rocks such as limestone. These habitats collectively support a wide range of plant communities and species. In more eutrophic (nutrient-rich) situations tall-herb communities can dominate such fens. The more eutrophic tall-herb fens are characterised by dense vegetation canopies with limited species diversity. Despite the reduced species diversity, however, they are an important and characteristic vegetation type in many areas often representing the only type of fen in intensively farmed lowland

landscapes. In the most disturbed and eutrophicated stands rank nitrophile herbs, such as greater willowherb and stinging nettle, replace more characteristic fen plants. Rich fens are also sometimes associated with grass dominated communities that are managed as fen meadows which support a characteristic variety of species.

In less eutrophic conditions, but where the influence of base-rich water remains strong (including sites where calcareous flushes irrigate acid soils), fen and fen meadow vegetation is characterised by a generally species-rich flora.

There is a UK Biodiversity Habitat Action Plan for fens and one for Reedbeds, which are also a type of fen. The plan for fens does not provide any detailed information on cover or distribution of this habitat. There is also a UK Biodiversity Habitat Action Plan for purple moor grass and rush pastures which incorporates some of the lowland acid mire communities included in these selection guidelines.

In North Yorkshire there are no detailed inventories of fens and lowland acid mires, although herbaceous fen vegetation has been recorded from Sites of Special Scientific Interest (SSSIs) in the local planning authority areas of Craven, Harrogate, Hambleton, Ryedale, and Selby. As well as SSSIs, fens are also known to be present in most of the Natural Areas and local authority areas within the county. There has, however, been a strong historical trend towards fragmentation of fens in North Yorkshire through land drainage, agricultural reclamation, afforestation and urban development.

The fens that do remain in the county include a variety of different types, depending on how they were formed, the existing and historical land-use and the nature of underlying rocks and substrates. Different types of fen within the county include valley mires in the Jurassic hills of Hambleton and Ryedale, kettle-hole fens in Richmondshire, and floodplain fens in the lowland vales. Some types of fen are unusual for the Natural Area in which they occur: for example, nutrient-poor fens in the predominantly eutrophic lowland vales.

These different fen types support a variety of vegetation communities, but in the North Yorkshire context many fen and mire communities are difficult to describe in relation to the National Vegetation Classification, especially in the lowland vales and foothills. Fen meadows, for example, often bear comparison with NVC communities such as M22 or M24 mires but lack important characteristic species.

2.4.3 Selection Criteria and Attributes

Table 16 Selection criteria and attributes for fen, lowland acid mire and spring and flush SINCs

CRITERION	ATTRIBUTE
Size	Area of site (ha). Larger sites are likely to have greater hydrological integrity and will usually be less affected by surrounding land use. However, small sites may be of great interest: some of the most valuable fens and mires in Yorkshire occur in kettle-holes or on the sites of former peat cuttings (turbaries) or mineral workings of quite limited area. A mire around a single spring could potentially have been in existence for thousands of years

Table 16 (cont.) Selection criteria and attributes for fen, lowland acid mire and spring and flush SINCs

CRITERION	ATTRIBUTE
Naturalness	Absence of artificial drainage or agricultural improvement. Evidence of historical continuity e.g. deep deposits of peat. Presence of natural hydrological influences e.g. springs, flooding etc. Presence of ancient wetland indicators, e.g. plants such as saw sedge (<i>Cladium mariscus</i>) and invertebrates such as flightless water beetles.
Diversity	Diversity of plant species, especially fen/mire indicators. Diversity of plant communities can reflect zonation related to hydrological and edaphic differences.
Rarity	Rarity of plant species, communities or fen types.
Representativeness	Presence of representative examples of NVC community types. Presence of locally distinctive fen/mire types e.g. valley mires in the Jurassic hills of Hambleton and Ryedale.
Position in an ecological unit	Connectivity with other semi-natural habitats, especially those representing different stages in the hydrosere (e.g. fens associated with wet woodland or dry unimproved grassland). Location and extent in relation to the physical environment, e.g. where a site forms part of a series of valley or floodplain fens.
Recorded history	Past biological recording, e.g. historical records of flora and fauna which may reflect change or continuity in a site's biota. Historical confirmation of hydrological or management influences e.g. documented sites of springs, sites shown as wetland on early maps, sites with common rights of turbary, and sites with a palynological record.
Fragility	Vulnerability of sites to eutrophication, agricultural improvement, drainage or unchecked successional change.

2.4.4 Fens, Lowland Mire, Springs & Flushes Selection Guidelines

Sites will be eligible for selection as a SINC if they meet one or more of the following guidelines.

Guideline

Fe1

Upland or lowland mires supporting representative examples of the following plant communities within a matrix of semi-natural wetland vegetation of at least 0.5 ha:

M4	<i>Carex rostrata-Sphagnum recurvum mire</i>
M5	<i>Carex rostrata-Sphagnum squarrosum mire</i>
M9	<i>Carex rostrata-Calliergon cuspidatum/giganteum mire</i>
M10	<i>Carex dioica-Pinguicula vulgaris mire</i>
M13	<i>Schoenus nigricans-Juncus subnodulosus mire</i>
M22	<i>Juncus subnodulosus-Cirsium palustre fen meadow</i>
M24	<i>Cirsio-Molinietum caeruleae fen-meadow</i>
M26	<i>Molinia caerulea-Crepis paludosa mire</i>
S1	<i>Carex elytra swamp</i>
S2	<i>Cladium mariscus swamp and sedge-beds</i>
S25	<i>Phragmites australis-Eupatorium cannabinum tall-herb fen</i>
S27	<i>Carex rostrata-Potentilla palustris tall-herb fen</i>

Application

This guideline will be applied to areas of lowland acid mire and fen meadow that have been identified as supporting the NVC communities listed above. The classification of the community should be based on a field assessment by a competent surveyor within 5 years of the date of designation and where necessary quadrat data.

Rationale

In the lowland areas of North Yorkshire these plant communities and the assemblage of plants and animals they support have become rare.

Guideline

Fe2

Stands of tall-herb fen and/or reedbed that do not qualify on other fen selection guidelines but are greater than 2ha in area and are predominantly comprised of one or more the following NVC communities:

- S4** *Phragmites australis* swamp and reed-beds
- S28** *Phalaris arundinacea* tall-herb fen
- M27** *Filipendula ulmaria-Angelica sylvestris* mire

Application

This guideline will be applied to areas of tall-herb fen that has been identified as supporting the NVC communities listed above. The classification of the community should be based on field assessment by a competent surveyor completed within 5 years of the date of designation. The tall-herb fen habitat should normally dominate the site, but may occur in combination with other fen, grassland swamp and mire communities and open water or scrub.

Rationale

Tall-herb fens have been adversely affected by agricultural intensification over the last 50 years resulting in the reduction and fragmentation of this habitat. Sites of this habitat of 2ha or greater are now rare within North Yorkshire.

Guideline

Fe3

Rich-fen sites greater than 0.5 ha scoring 10 or more from the species listed in Table 17.

Application

This guideline may be applied to any fen site that includes a representative selection of the species listed in Table 17. These species are characteristic of species-rich, good quality rich-fen habitats.

Rationale

Rich-fen sites have been adversely affected by agricultural and other land-use changes in North Yorkshire and remaining sites are often small and isolated from other similar habitat. However, such sites continue to be of high nature conservation value as representative examples of the rich-fen habitat and plant and animal communities it supports.

Guideline

Fe4

Poor-fen and acid mire sites greater than 0.25 ha scoring 8 or more from the species listed in Table 18.

Application

This guideline may be applied to any fen site, which includes a representative selection of the species listed in Table 18. These species are characteristic of good quality poor-fen habitat.

Rationale

Poor-fen sites are rare within North Yorkshire (outside the 2 National Parks & the City of York) and support specialised groups of plants and animals adapted to the particular environmental conditions associated with this habitat.

Guideline

Fe5

Mixed fen and mire sites greater than 0.25 ha scoring 10 or more from the combined species lists in Tables 17 and 18.

Application

This guideline should be applied to fen and/or lowland acid mire complexes that cannot readily be distinguished as rich-fen, poor-fen or lowland mire and do not qualify under any of the other selection guidelines. Species that are present in both Tables 17 and 18 should not be counted twice.

Rationale

This mixed fen and mire sites may not meet the selection guidelines for the different fen types that may be present. These sites represent valuable transitional fen communities, which reflect complex variations in topography, substrate and hydrology.

Guideline

Fe6

Areas that support springs and associated flushes comprised of the following NVC communities:

- | | |
|------------|---|
| M37 | <i>Cratoneurion commutatum</i> – <i>Festuca rubra</i> spring |
| M38 | <i>Cratoneurion commutatum</i> – <i>Carex nigra</i> spring |

Application

This guideline should be applied to habitats associated with springs and flushes. Only significant concentrations of these spring types should be selected in upland areas.

Rationale

Springs and their associated flushes often occur in combination with grassland, heath, scrub, woodland and other habitats. Where they are unaffected by agricultural improvements they can support valuable and distinctive assemblages of species of mire, fen and spring-head habitats. These assemblages of species are unique to the ecological circumstances of the spring-head and associated flush community and are reliant upon the supply and quality of water arising from the local bedrock. Calcareous springs are some of the most natural habitats in North Yorkshire, especially where they are associated with scrub and woodland. These spring types are listed in the EC Directive on the Conservation of Natural Habitats and Wild Fauna & Flora (EC Habitats Directive 1992) as a priority habitat type for which member states should designate Special Areas for

Conservation (SAC). As such the UK has an international responsibility to maintain these habitats within and outside SACs.

Guideline

Fe7

Areas that support good concentrations of springs and associated flushes comprised of the following NVC communities:

- M32 *Philonotis fontana* – *Saxifraga stellaris* spring**
M36 Lowland springs and streambanks of shaded situations

Application

This guideline should be applied to habitats associated with springs and flushes. Only significant concentrations of these spring types should be selected in upland areas.

Rationale

Springs and their associated flushes often occur in combination with grassland, heath, scrub, woodland and other habitats. Where they are unaffected by agricultural improvement they can support valuable and distinctive assemblages of species of mire, fen and spring-head habitats. These assemblages of species are unique to the ecological circumstances of the spring-head and associated flush community and are reliant upon the supply and quality of water arising from the local bedrock. These habitats can also be particularly valuable for invertebrates.

Table 17. Plant species characteristic of rich-fens

<u>Scientific name</u>	<u>Common name</u>
<i>Achillea ptarmica</i>	sneezewort
Anagallis tenella	bog pimpernel
<i>Angelica sylvestris</i>	angelica
<i>Athyrium filix-femina</i>	lady fern
<i>Berula erecta</i>	lesser water-parsnip
Blysmus compressus	flat sedge
Calamagrostis canescens	purple small-reed
<i>Caltha palustris</i>	marsh marigold
<i>Carex</i> spp.	sedges (all species)
Cirsium dissectum	meadow thistle
Cladium mariscus	saw sedge
Dactylorhiza spp. (except <i>D. fuchsii</i>)	marsh orchids (all species)
<i>Eleocharis</i> spp. (except <i>E. palustris</i>)	spike-rushes
Epipactis palustris	marsh helleborine
<i>Equisetum fluviatile</i>	water horsetail
<i>Equisetum telmateia</i>	giant horsetail
Eriophorum latifolium	broad-leaved cotton grass
<i>Eriophorum</i> spp. (other than above)	cotton-grasses
<i>Eupatoria cannabinum</i>	hemp agrimony
<i>Galium uliginosum</i>	fen bedstraw
<i>Geum rivale</i>	water avens
Gymnadenia conopsea	fragrant orchid
<i>Hydrocotyle vulgaris</i>	marsh pennywort
<i>Hypericum tetrapterum</i>	square-stalked St. John's-wort
<i>Iris pseudacorus</i>	yellow flag
Juncus subnodulosus	blunt-flowered rush
Juncus compressus	round-fruited rush
<i>Listera ovata</i>	tway blade
<i>Lotus pedunculatus</i>	greater birdsfoot trefoil
<i>Lychnis flos-cuculi</i>	ragged robin
<i>Lycopus europaeus</i>	gipsywort
<i>Lysimachia nemorum</i>	yellow pimpernel
<i>Lysimachia nummularia</i>	creeping jenny
<i>Lysimachia vulgaris</i>	yellow loosestrife
<i>Lythrum salicaria</i>	purple loosestrife
<i>Mentha aquatica</i>	water mint
<i>Menyanthes trifoliata</i>	bogbean
<i>Molinia caerulea</i>	purple moor-grass
Parnassia palustris	grass-of-Parnassus
<i>Pedicularis palustris</i>	marsh lousewort
<i>Pedicularis sylvatica</i>	lousewort
<i>Phragmites australis</i>	common reed
Pinguicula vulgaris	butterwort
<i>Potentilla palustris</i>	marsh cinquefoil
Primula farinosa	bird's-eye primrose
<i>Pulicaria dysenterica</i>	fleabane
<i>Ranunculus flammula</i>	lesser spearwort
<i>Sanguisorba officinalis</i>	great burnet
Schoenus nigricans	black bog rush
<i>Scutellaria galericulata</i>	skullcap
Scutellaria minor	lesser skullcap
<i>Scirpus sylvaticus</i>	wood club-rush

Table 17 (cont.) Plant species characteristic of rich-fens

<u>Scientific name</u>	<u>Common name</u>
<i>Serratula tinctoria</i>	saw-wort
<i>Stellaria palustris</i>	marsh stitchwort
<i>Succisa pratensis</i>	devil's-bit scabious
<i>Thalictrum flavum</i>	meadow-rue
<i>Triglochin palustris</i>	marsh arrow-grass
<i>Trollius europaeus</i>	globeflower
<i>Utricularia</i> spp.	bladderwort (all species)
<i>Valeriana dioica</i>	marsh valerian
<i>Valeriana officinalis</i>	common valerian
<i>Veronica scutellaria</i>	marsh speedwell
<i>Viola palustris</i>	marsh violet

Table 18 Plant species characteristic of poor fens and acid mires

<u>Scientific name</u>	<u>Common name</u>
<i>Agrostis canina</i>	velvet bent
Anagallis tenella	bog pimpernel
Andromeda polifolia	bog rosemary
<i>Calluna vulgaris</i>	heather
<i>Carex</i> spp.	sedges (all species)
Dactylorhiza spp. (except <i>D. fuchsii</i> and <i>maculata</i>)	marsh orchids (all species)
<i>Danthonia decumbens</i>	heath-grass
Drosera spp.	sundew
<i>Empetrum nigrum</i>	crowberry
<i>Epilobium palustre</i>	marsh willowherb
<i>Erica tetralix</i>	cross-leaved heath
<i>Eriophorum</i> spp.	cotton-grasses (all species)
<i>Galium palustre</i>	marsh bedstraw
Gentiana pneumonanthe	marsh gentian
<i>Hydrocotyle vulgaris</i>	marsh pennywort
<i>Isolepis setacea</i>	bristle club rush
<i>Juncus acutiflorus</i>	sharp-flowered rush
<i>Juncus squarrosus</i>	heath rush
<i>Menyanthes trifoliata</i>	bogbean
<i>Molinia caerulea</i>	purple moor-grass
<i>Montia fontana</i>	blinks
Myrica gale	bog myrtle
Narthecium ossifragum	bog asphodel
<i>Pedicularis palustris</i>	marsh lousewort
<i>Pedicularis sylvatica</i>	common lousewort
Potentilla palustris	marsh cinquefoil
<i>Ranunculus flammula</i>	lesser spearwort
<i>Salix aurita</i>	eared willow
<i>Salix repens</i>	creeping willow
Saxifraga hirculus	marsh saxifrage
<i>Scutellaria galericulata</i>	skullcap
Scutellaria minor	lesser skullcap
<i>Sphagnum</i> spp.	bog moss
<i>Stellaria uliginosa</i>	bog stichwort
<i>Succisa pratensis</i>	devil's-bit scabious
<i>Trichophorum caespitosum</i>	deer grass
Utricularia spp.(all species)	bladderwort
Vaccinium oxycoccus	cranberry
<i>Viola palustris</i>	marsh violet

Habitat Selection Guidelines

2.5 Standing Water Habitats

Standing water includes a variety of essentially non-flowing water habitats, although it is recognised that some standing waters do have inflows and outflows of water. Standing waters occur in many different shapes and sizes including lakes, ponds, reservoirs, ditches and canals. Some of these are natural features of the landscape, whilst others are created by human activity. All standing water habitats support areas of open water with associated submerged, floating and marginal plant communities where the water table is permanently above the sediment surface. Where water levels drop below the surface for part of the year, the habitat is included in other selection guidelines covering wet woodland and fen. By definition water filled ditches must have a rate of flow, this varies considerably from one ditch to another and according to time of year. These guidelines include ditches that usually support water throughout the year and thereby support a wetland or aquatic flora and fauna. Where ditches have obvious flow and are stream-like, they should be considered under the flowing water selection guidelines. If there is a level of uncertainty regarding perceptible flow, ditches could be tested under either flowing or standing water guidelines to establish which is most relevant.

Standing water sites can be broadly categorised into eutrophic, mesotrophic and oligotrophic water bodies based on the nutrient status of the water. Whilst chemical parameters have been defined, the interactions between nutrients and biota in standing waters are very complex and adequate data are rarely available. The ranges of concentrations stated are those that usually characterise the water body type; concentrations may vary outside these ranges according to the aforementioned interactions and the time of year. These different types of standing water support characteristic plant and animal assemblages. There are UK Biodiversity Habitat Action Plans for eutrophic and mesotrophic standing waters only.

2.5.1 Eutrophic standing water

According to the UK Habitat Action Plan, eutrophic waters are found throughout the UK, although they are most typical of hard water lowland areas in the south and east. In the north and west they occur especially near the coast. The total UK area for eutrophic areas is thought to be in the region of 1785km². In England, it is estimated there is an area of approximately 675km² of still inland waters, of which 80% is thought to be eutrophic.

Eutrophic Waters are characterised by their high levels of key plant nutrients. Phosphorus levels are typically greater than 0.035 mg/l and inorganic nitrogen concentrations are greater than 0.5mg/l. These are the lower limits of eutrophic waters and sites often support significantly higher concentrations than this. Owing to the high levels of nutrients these waters often support algal blooms in the summer.

Eutrophic waters can support a high biodiversity, including planktonic algae and zooplankton, as well as submerged, floating and marginal plant assemblages. Many eutrophic standing waters are also of importance for their invertebrate assemblages, in particular dragonflies and damselflies, water beetles and snails. In addition, they can also support a rich marginal fauna of non-aquatic species. Eutrophic standing waters can also be important for coarse fish such as roach, tench and pike and salmonids where they occur naturally.

2.5.2 Mesotrophic standing water

According to the UK Habitat Action Plan, mesotrophic standing waters are relatively infrequent in the UK and are largely confined to the margins of the upland areas in the north and west of the country. Mesotrophic waters are characterised by a moderate range of nutrients that is not so high as to be eutrophic or so low as to prevent reasonable plant growth in the summer, although normally

almost all of the key plant nutrients are taken up by algal growth during the summer. Mesotrophic waters are defined here as those capable of supporting a diverse macrophyte flora, but with relatively clear water and limited growth of planktonic or filamentous algae. Macrophyte communities will include at least some vascular plants or charophytes intolerant of nutrient-enriched conditions particularly nitrogen and phosphorus. Typically, mesotrophic waters have a narrow range of nutrient levels inorganic nitrogen concentrations of 0.3-0.65 mg/l and total phosphorus concentrations of 0.01-0.035mg/l. As a consequence, this habitat is becoming increasingly rare as artificial inputs of nutrients from agriculture and industry increase the trophic status of such water bodies.

Mesotrophic waters can support a higher diversity of submerged water plants (macrophytes) than any other standing water type. They often also support populations of nationally scarce and rare species. Many fish species have been artificially introduced to mesotrophic waters and hence there are very few natural fish assemblages.

2.5.3 Oligotrophic and dystrophic standing waters

Oligotrophic waters are primarily found in upland areas in association with hard, nutrient-poor rocks that provide a supply of mineral-poor waters. They support a low primary productivity due to low concentrations of dissolved nutrients, in particular nitrogen and phosphorous, which are primarily bound up in small amounts of organic sediment. The low rate of production and the high levels of dissolved oxygen in the water combine to ensure that the annual organic production is almost completely decomposed.

Oligotrophic waters are usually clear, there is little accumulation of organic matter and the substrate is often comprised of hard acidic rocks and mineral material. Marginal and submerged vegetation is characterised by a suite of plant species restricted to acid waters.

Dystrophic waters are associated with peatland systems and have a high content of colloidal organic material. The high level of organic matter suspended in the water imparts to it a dark brown colour. This high organic content also reduces the levels of dissolved oxygen in the water column to low levels. At the water surface, however, where oxygen levels are higher, there can be decomposition of the organic content of the water, which releases nitrogen and phosphorus in sufficient amount to allow the growth of algae on or near the water surface during the growing season.

These nutrient-poor water bodies can also sometimes support significant areas of exposed sediment and rocky shore, which support a valuable invertebrate fauna including nationally scarce species.

There is little data on the extent or distribution of oligotrophic and dystrophic waters in North Yorkshire, but they are mainly restricted to upland and upland fringe areas where they are often associated with peatland and upland heath habitats.

2.5.4 Types of Standing Water habitat in North Yorkshire

In North Yorkshire there is a wide variety of different standing water bodies, some of which are natural in origin, whilst many others have been created by human activity. Many of the best standing water sites support a range of habitat structures and some of the highest quality sites support only a small proportion of open water. The following list indicates the type and variety of this habitat within the county.

Natural lakes

Lakes formed within a natural basin. Evidence of human intervention can be seen in the present character of most natural lakes e.g. at Throxenby Mere, a dam was constructed which enhanced the existing swamp and bog habitats. Most natural lakes are associated with SSSIs e.g. Malham Tarn in Yorkshire Dales National Park and Lake Gormire in North York Moors National Park.

Coastal slippage ponds

These are created due to movements in coastal boulder clay. Associated areas of fen and swamp often develop. They can be brackish depending upon their proximity to sea spray and the water table.

Oxbow ponds

Develop as a result of dynamic, migratory rivers changing course leaving isolated former meanders of the river. They are now scarce due to river engineering, although there are concentrations along the middle sections of the River Rye and along the River Riccall. They are important for their naturalness and connectivity with the river corridor resulting in a concentration of habitats in close proximity.

Peatland pools

Usually small and temporary they form as a result of the topography of the mire or fen. They lie mainly within the upland fringes. In the lowlands they are confined to extensive tracts of lowland heath such as Skipwith Common SSSI.

Salt marsh pools

Fluctuating ponds within salt marsh pastures associated with the River Esk. During late summer months they are often dry.

Inland brackish waters

These standing waters are associated with mining subsidence of unusual ionic content e.g. Fairburn Ings SSSI.

Dew ponds

Special category of stock watering ponds associated with chalk and limestone hills e.g. Kirbymoorside, Tabular Hills, and Thixendale where there are few available natural water sources. They were designed so as to create a basin to capture rainfall and surface run-off.²⁶ They are often isolated habitats within naturally dry landscapes and, therefore, form an important feature. Further information lies within the Ryedale Biodiversity Audit.

Stock watering ponds

Usually originating from the time of the Enclosure Acts these ponds are associated with pasture, although some on common land are of much older origin.

Reservoirs

Constructed for irrigation and water storage. Mainly of ornithological interest, although some support a specialised flora associated with drawdown zones.

Borrowpits

Associated with river corridors, railway lines and roads these standing waters have arisen where material has been excavated for construction of floodbanks and other embankments. Concentrations of these pits are important. The vegetation is variable according to trophic status. For example, some can be excavated into underlying clay subsoils and, therefore, be relatively mesotrophic whereas others are highly eutrophic.

Mineral extraction sites

These are clay, marl and sand and gravel extraction sites often associated with river corridors and gypsum flashes of the Southern Magnesian Limestone. These sites can be very variable ranging from deep gravel pits to new brick pits and small shallow hand dug clay ponds typical of Victorian brick works e.g. Anchor Plain complex. These sites become more natural in time by natural colonisation of plants and animals. Freedom from human disturbance, including pollution and recreation, is beneficial for wildlife interest particularly birds. A concentration of former gravel pits

²⁶ Hammond, M. Ryedale Biodiversity Audit , Ryedale District Council (unpub).

along the Rivers Swale and Ure form major biologically important features of the valleys. Many of these pits are of value for breeding waterfowl and passerines (perching birds). There is a particular concentration of flooded former marl pits within the Vale of York; these are smaller artificially created waterbodies. The condition of many of these ponds, however, is unclear and it is thought that many may be affected by artificial eutrophication (M. Hammond, *pers. comm*).

Mill ponds

Originally constructed to store water to power water mills, these ponds can be very variable and their wildlife interest is infrequently recorded.

Fish ponds

Historic fishponds may support a range of features such as rich marginal vegetation, areas of relic fen or secondary wet woodland. They are often present as a series of interconnecting ponds, which provides a filtration system.

Ornamental lakes

Often associated with large estates or a parkland landscape. These sites can be of significant biological importance, although they tend to be eutrophic. The marginal vegetation often includes swamp communities and common reed. Larger lakes are important roosting sites for waterfowl and diving ducks. Good quality standing waters occur at Hornby Castle, Forcett Park and Castle Howard.

Other historic ponds

Constructed for various specialised purposes such as sheep dipping, washing & watering livestock, and wooden cartwheel washing. This includes village green ponds.

Drawdown zones & open vegetation of inundation habitat

Habitats subject to prolonged flooding followed by brief periods of drying-out, usually in late summer can support a highly specialised flora including scarce species. Such communities are represented within semi-natural habitat mosaics (e.g. within floodplain grasslands and fens) or in artificial environments, such as reservoir margins.

Canals

The canals in North Yorkshire are generally well used for recreation, the margins and bank sides can be important. There are no semi-derelict canals.

Ditches

Artificially created and maintained drainage channels usually associated with local agricultural land drainage. Depending upon their location, they may be permanently watered or may become dry at different periods of the year. There are large concentrations of ditches in the county particularly in the arable areas within the lowland vales.

Gypsum subsidence hollows

These standing waters are formed as a result of the collapse of under-ground caves due to dissolution of Permian gypsum. They are particularly notable between Ripon and Bedale.

Other man made “pond” structures

These include balancing lagoons and old abandoned outdoor swimming pools that develop interest for both flora and fauna.

2.5.4 Selection Criteria and Attributes

Table 19 Selection criteria and attributes for standing water SINC

CRITERION	ATTRIBUTE
Size	The area of a site or, for canals, length in metres
Diversity	The diversity of vegetation structure and successional stages of marginal, emergent, submerged and floating aquatic vegetation.
Naturalness	The presence of natural features, evidence of longevity and maturation. Absence of invasive alien species. Use of trophic status/ nutrient level data. Absence of physical or chemical pollution including absence of human manipulation such as artificial fish stocking
Rarity	The presence of nationally rare or declining species; presence of regionally important species; presence of locally rare or declining plant species or species/communities of restricted distribution, which have a population stronghold in North Yorkshire.
Representativeness	The use of trophic status/nutrient level data, Conductivity, pH, hardness data where available. Presence of marl ponds in Vale of York or dewponds on chalk or limestone. The presence of aquatic NVC communities. (NVC data will be used where it is available, as aquatic vegetation is under-recorded in North Yorkshire).
Position in an ecological unit	The proximity to and connections with other wetlands or habitats necessary for the survival of other biotic groups (invertebrates & amphibians), including non-designated sites or designated sites. Site in key migration route for wildlife including fish. Buffer zone function
Fragility	Point source or diffuse source pollution does not adversely affect the site.

2.5.5 General application of Standing Water Guidelines

The guidelines for standing waters should be applied to areas of permanent or seasonal open water and associated swamp habitats of natural and artificial origin. Subsidiary habitats such as wet woodland and fen that may be associated with standing water sites can also be included within the SINC, if they warrant designation in their own right. If they do not merit designation, they may also be included within the standing water SINC, if they are hydrologically contiguous with the standing water or provide important habitat for part of the life cycle of species of interest that are associated with the SINC. There is no minimum size threshold for selection; however, linear sites, for example, canals, should be assessed in sections between readily identifiable features such as bridges or locks.

2.5.6 Standing Water Selection Guidelines

Areas of standing water, with any integral marginal vegetation that meet any one or more of the following guidelines will be eligible for selection as a SINC.

Guideline

Sw1

A nutrient-rich standing water site that scores 10 or more from the species listed in Table 20 with at least one species recorded from each of two of the following habitat zones of submerged, floating and swamp habitat.

Application

The majority of the species recorded from Table 20 should be well distributed throughout the site. If they are rare or restricted to a few areas the site should not be designated.

Rationale

The species listed in Table 20 provide an indication of a diverse and good quality standing water habitat, with a range of different vegetation communities from open water through to marginal swamp vegetation that is of nature conservation value.

Guideline

Sw2

A nutrient poor standing water that scores 5 or more from the species listed in Table 21.

Application

The majority of the species recorded from Table 21 should be well distributed throughout the site. If they are rare or restricted to a few areas the site should not be designated on the basis of this guideline.

Rationale

The species listed in Table 21 are indicative of good examples of nutrient poor (mesotrophic, oligotrophic through to dystrophic) water bodies with a variety of habitat.

Guideline

Sw3

A standing water that supports one of the known rare aquatic habitats in North Yorkshire as follows:

- a) mesotrophic standing water
- b) *Littorella* vegetation
- c) 5 or more submerged aquatic species
- d) stable charophyte communities
- e) NVC communities A4 *Hydrocharis morsus-ranae-Stratiotes aloides*, A13 *Potamogeton perfoliatus-Myriophyllum alterniflorum* community
- f) maritime brackish water ponds characterised by the presence of the following species: *Oenanthe crocata* (hemlock water dropwort), *Myriophyllum spicatum* (spiked water millfoil), *Potamogeton pectinatus* (fennel pondweed), *Juncus gerardii* (mud rush), *Bolboschoenus maritimus* (sea club-rush) *Ranunculus bardotii*

Application

This guideline is to be applied to those key habitats that are known to be rare and are valued within the county. Under a) mesotrophic standing water is defined in earlier text. Under d) this is not intended to be applied to pioneer communities dominated by *Chara* in process of succession to macrophyte communities or to ditches dredged two years ago or less.

Rationale

The above are rare habitats or vegetation community types in North Yorkshire and are worthy of protection.

Guideline

SW4

A standing water site that supports seasonal draw down zones and open vegetation of inundation habitat characterised by:

a) the presence of 1 or more of the specialist species asterisked in Table 22 and 1 or more of the other characteristic species shown in Table 22

b) one of the following NVC communities:

OV29 *Alopecurus geniculatus* – *Rorippa palustris*
 OV30 *Bidens tripartita* - *Persicaria amphibia*
 OV31 *Rorippa palustris* – *Gnaphalium uliginosum*
 OV35 *Lythrum portula* – *Ranunculus flammula*

Application

This applies to sites that hold standing water due to prolonged or seasonal flooding or standing water sites where the water levels fluctuate. These may be floodplain grasslands or fens or reservoirs.

Rationale

These narrow zones can support highly specialised flora including nationally scarce species.

Table 20 Indicative species list for nutrient rich standing waters (eutrophic through to mesotrophic)

<u>Scientific name</u>	<u>Common name</u>	<u>Characteristic mesotrophic spp</u>
<i>Alisma lanceolatum</i>	narrow-leaved water-plantain	
<i>Alisma. plantago-aquatica</i>	water plantain	
<i>Apium inundatum</i>	lesser marshwort	*
<i>Apium nodiflorum</i>	fool's water-cress	
<i>Baldellia ranunculoides</i>	lesser water-plantain	*
<i>Berula erecta</i>	lesser water-parsnip	
<i>Butomus umbellatus</i>	flowering rush	
<i>Callitriche hermaphroditica</i>	autumnal water-star-wort	
<i>Callitriche obtusangula</i>	blunt-fruited water-star-wort	
<i>Callitriche platycarpa</i>	various-leaved water-star-wort	
<i>Callitriche stagnalis</i>	common water-star-wort	
<i>Carex spp</i>	any sedge	
<i>Catabrosa aquatica</i>	water whorl-grass	
<i>Ceratophyllum demersum</i>	rigid hornwort	
<i>Charophytes</i>	any stonewort	*
<i>Cladium mariscus</i>	great fen sedge	*
<i>Eleocharis acicularis</i>	needle spike-rush	
<i>Eleogiton fluitans</i>	floating club-rush	*
<i>Equisetum fluviatile</i>	water horsetail	
<i>Groenlandia densa</i>	opposite-leaved pondweed	

Table 20 (cont.) Indicative species list for nutrient rich standing waters (eutrophic through to mesotrophic)

<u>Scientific name</u>	<u>Common name</u>	<u>Characteristic mesotrophic spp</u>
<i>Glyceria declinata</i>	small sweet-grass	
<i>Glyceria fluitans</i>	floating sweet-grass	
<i>Glyceria maxima</i>	reed sweet-grass	
<i>Glyceria notata</i>	plicate sweet-grass	
<i>Hippuris vulgaris</i>	mare's tail	
<i>Hottonia palustris</i>	water violet	*
<i>Hydrocharis morsus-ranae</i>	frogbit	*
<i>Hydrocotyle vulgaris</i>	marsh penny wort	
<i>Iris pseudacorus</i>	yellow flag	
<i>Lemna polyrhiza</i>	greater duckweed	
<i>Littorella uniflora</i>	shoreweed	*
<i>Lythrum salicaria</i>	purple loosestrife	
<i>Mentha aquatica</i>	water mint	
<i>Menyanthes trifoliata</i>	bogbean	*
<i>Myosotis laxa</i>	tufted forget-me-not	
<i>Myosotis scorpioides</i>	water forget-me-not	
<i>Myosotis secunda</i>	creeping forget-me-not	
<i>Myriophyllum alterniflorum</i>	alternate water milfoil	*
<i>Myriophyllum spicatum</i>	spiked water milfoil	
<i>Myriophyllum verticillatum</i>	whorled water-milfoil	
<i>Nitella spp.</i>	any stonewort	
<i>Nuphar lutea</i>	yellow water-lily	
<i>Nymphaea alba</i>	white water-lily	
<i>Oenanthe aquatica</i>	fine leaved water dropwort	
<i>Oenanthe crocata</i>	hemlock water drop-wort	
<i>Oenanthe fistulosa</i>	tubular water-dropwort	
<i>Oenanthe lachenalii</i>	parsley water-dropwort	
<i>Persicaria amphibia</i>	amphibious bistort	
<i>Phalaris arundinacea</i>	canary reed-grass	
<i>Phragmites australis</i>	common reed	
<i>Pilularia globulifera</i>	pillwort	*
<i>Potamogeton alpinus</i>	red pondweed	*
<i>Potamogeton berchtoldii</i>	small pondweed	
<i>Potamogeton coloratus</i>	fen pondweed	*
<i>Potamogeton crispus</i>	curled pondweed	
<i>Potamogeton gramineus</i>	various-leaved pondweed	*
<i>Potamogeton obtusifolius</i>	blunt-leaved pondweed	*
<i>Potamogeton natans</i>	broad-leaved pondweed	
<i>Potamogeton pectinatus</i>	fennel-leaved pondweed	
<i>Potamogeton pusillus</i>	lesser pondweed	
<i>Potamogeton trichoides</i>	hairlike pondweed	
<i>Ranunculus spp (aquatic)</i>	water-crowfoot species	
<i>Riccia/Ricciocarpus spp.</i>	liverworts	
<i>Rorippa nasturtium-aquaticum</i>	water-cress	
<i>Rumex hydrolapathum</i>	water dock	
<i>Sagittaria sagittifolia</i>	arrowhead	
<i>Schoenoplectus lacustris</i>	common club-rush	

Table 20 (cont.) Indicative species list for nutrient rich standing waters (eutrophic through to mesotrophic)

<u>Scientific name</u>	<u>Common name</u>	<u>Characteristic mesotrophic spp</u>
<i>Schoenus nigricans</i>	black bog-rush	
<i>Scirpus sylvaticus</i>	wood club-rush	
<i>Sparganium erectum</i>	branched bur-reed	
<i>Sparganium emersum</i>	unbranched bur-reed	
<i>Sparganium natans</i>	least bur-reed	*
<i>Typha angustifolia</i>	narrow-leaved bulrush	
<i>Typha latifolia</i>	bulrush	
<i>Utricularia spp.</i>	any species of bladderwort	*
<i>Veronica anagallis-aquatica</i>	blue water-speedwell	
<i>Veronica beccabunga</i>	brooklime	
<i>Veronica catenata</i>	pink water-speedwell	
<i>Zannichellia palustris</i>	horned pondweed	

Table 21 Indicative species list for nutrient poor standing waters (dystrophic, oligotrophic through to mesotrophic)

<u>Scientific name</u>	<u>Common name</u>	<u>Characteristic mesotrophic spp</u>
<i>Apium inundatum</i>	lesser marshwort	*
<i>Baldellia ranunculoides</i>	lesser water-plantain	*
<i>Callitriche hamulata</i>	intermediate water-star-wort	
<i>Carex paniculata</i>	greater tussock sedge	
<i>Carex limosa</i>	mud sedge	
<i>Carex rostrata</i>	bottle sedge	
<i>Charophyte spp</i>	any stonewort	*
<i>Cladium mariscus</i>	great fen sedge	*
<i>Eleogiton fluitans</i>	floating club-rush	*
<i>Equisetum fluviatile</i>	water horsetail	
<i>Eriophorum latifolium</i>	broad-leaved cotton grass	
<i>Eriophorum spp.</i>	any other species of cotton grass	
<i>Hippuris vulgaris</i>	mare's tail	
<i>Hottonia palustris</i>	water violet	*
<i>Hydrocharis morsus-ranae</i>	frogbit	*
<i>Juncus bulbosus</i>	bulbous rush	
<i>Littorella uniflora</i>	shoreweed	*
<i>Lobelia dortmanna</i>	water lobelia	
<i>Menyanthes trifoliata</i>	bogbean	*
<i>Myosotis stolonifera</i>	pale forget-me-not	
<i>Myriophyllum alterniflorum</i>	alternate water-milfoil	*
<i>Nitella spp.</i>	stonewort	
<i>Nymphaea alba</i>	white water-lily	
<i>Pilularia globulifera</i>	pillwort	*
<i>Potamogeton alpinus</i>	red pondweed	*
<i>Potamogeton coloratus</i>	fen pondweed	*
<i>Potamogeton gramineus</i>	various-leaved pondweed	*
<i>Potamogeton natans</i>	broad-leaved pondweed	
<i>Potamogeton obtusifolius</i>	blunt-leaved pondweed	*
<i>Potamogeton perfoliatus</i>	perfoliate pondweed	
<i>Potamogeton polygonifolius</i>	bog pondweed	
<i>Potentilla palustris</i>	marsh cinquefoil	
<i>Ranunculus flammula</i>	lesser spearwort	
<i>Ranunculus spp. (aquatic)</i>	water crowfoot species	
<i>Schoenoplectus tabernaemontani</i>	grey club-rush	
<i>Sparganium natans</i>	least bur-reed	*
<i>Sphagnum spp.</i>	bog moss	
<i>Utricularia spp.</i>	any species of bladderwort	*

Table 22 Indicative species list for draw-down zones and open vegetation of inundation habitat

<u>Scientific name</u>	<u>Common name</u>	<u>Specialist species</u>
<i>Agrostis stolonifera</i>	creeping bent	
<i>Alopecurus aequalis</i>	orange foxtail	*
<i>Alopecurus geniculatus</i>	marsh foxtail	
<i>Bidens spp.</i>	bur marigolds	
<i>Callitriche spp.</i>	water-starworts	
<i>Chenopodium polyspermum</i>	many-seeded goosefoot	*
<i>Chenopodium rubrum</i>	red goosefoot	
<i>Eleocharis acicularis</i>	needle spike-rush	*
<i>Gnaphalium uliginosum</i>	marsh cudweed	
<i>Hydrocotyle vulgaris</i>	marsh pennywort	
<i>Juncus bufonius</i>	toad rush	
<i>Limosella aquatica</i>	mudwort	*
<i>Littorella uniflora</i>	shoreweed	*
<i>Lythrum portula</i>	water purslane	*
<i>Myosotis spp</i>	water forget-me-nots	
<i>Persicaria amphibia</i>	amphibious bistort	
<i>Persicaria laxiflora</i>	tasteless water-pepper	*
<i>Persicaria minor</i>	small water-pepper	*
<i>Pilulifera globulifera</i>	pillwort	*
<i>Polygonum hydropiper</i>	water-pepper	
<i>Potentilla anserina</i>	silverweed	
<i>Potentilla palustris</i>	marsh cinquefoil	
<i>Ranunculus repens</i>	creeping buttercup	
<i>Rorippa spp</i>	the smaller yellow-cress species	
<i>Rorippa palustris</i>	marsh dock	*
<i>Rumex maritimus</i>	golden dock	*
<i>Veronica scutellata</i>	marsh speedwell	

Habitat Selection Guidelines

2.6 Flowing Water Habitats

North Yorkshire supports a diverse range of flowing water including large lowland rivers flowing steadily across extensive floodplains with alluvial deposits, fast flowing small upland fringe watercourses, flowing over hard siliceous rocks, and calcareous streams of the Yorkshire Wolds.

These guidelines primarily include rivers and specific types of streams. Springs are included in the guidelines for the selection of fen and lowland mire habitat. Waterside habitats closely linked to rivers and streams such as flood meadows, fens and wet woodland are covered by other selection guidelines. Canals are included under the standing water section as their plant communities are more characteristic of standing than flowing water systems. Species strongly associated with flowing water habitats, such as water vole, otter and the white-clawed crayfish, are included in selection guidelines for species groups.

Rivers are dynamic ecosystems in their natural state, however, there are few natural rivers remaining within the UK and such rivers represent a valuable resource.²⁷ There are several near natural rivers in North Yorkshire; these are the Rivers Swale, Ure and the middle reaches of the Rye. Throughout its length, a river will pass through different developmental stages, each with different characteristics and nature conservation value. Near to the source of a river, watercourses are often small, narrow and fast flowing. As the volume of water increases from tributaries the headwater streams form larger watercourses and eventually rivers. In their lower reaches rivers typically flow more slowly over gently sloping flood plains before discharging into the sea. The different parts of this generalised model of a watercourse support a variety of different in-channel features and are often associated with quite different waterside habitats. The variation in rate of flow and volume of water affects the deposition of waterborne sediments and other materials, which in turn affects the substrate and physical structure of the river.

The mosaic of features found in rivers and streams support a diverse range of plants and animals. Riffles and pools support aquatic species, and exposed river sediments such as shingle beds and sand bars are very important for a range of invertebrates, notably ground beetles, spiders and craneflies. Marginal and bankside vegetation is important for its floristic value and the fauna it supports. Rivers and streams often provide a wildlife corridor that forms an important link with fragmented habitats.

Along many stretches of rivers attempts have been (and continue to be) made to control and confine natural processes through dredging of silts and other substrates, construction of flood banks, re-enforcement of banks and straightening of watercourses. All these activities affect the diversity and nature of both in-channel habitats and those of the riverside. These physical modifications and controls affect the ability of a river to create the diversity of river habitat normally associated with natural river systems. This in turn affects the variety of habitats and niches available to plants and animals.

The diversity of plant and animal species is not only affected by the physical characteristics of the river, but also by the condition of the water itself. In general terms, upland rivers and watercourses near to source tend to have lower concentrations of dissolved plant nutrients, less pollution and much higher levels of dissolved oxygen. In contrast, lowland, middle and lower courses of rivers receive large inputs of organic and inorganic material and increased levels of nutrients and other elements. In these parts of the rivers, where flows are slower and there is less incorporation of oxygen from the air, dissolved oxygen levels exhibit seasonal and diurnal fluctuations.

²⁷ UK Biodiversity Steering Group (1998). Biodiversity: The UK Steering Group Report, Volume 2 Action Plans, 1995.

The chemical composition of some flowing waters is also greatly influenced by the bedrock within the catchment of the river. This can also significantly affect the variety of plants and animals found within the watercourse. Watercourses with a good water quality, for example, will generally support a higher diversity of aquatic invertebrates than those that are heavily polluted. Water quality can also affect the diversity of fish and other animal groups. Heavily polluted watercourses also exhibit changes in the submerged aquatic flora. Eutrophication of rivers and streams from artificial sources, for example, can result in a shift from submerged vegetation dominated by macrophytes to communities dominated by algae.

2.6.1 Brief Description of Key Rivers in North Yorkshire

Brief information regarding the general characteristics of key rivers is provided. There are some rivers and their catchments, within North Yorkshire for which there is little available or accessible information, or the information is widespread and needs time and resources to be collated and analysed. The omission of specific rivers or details is as a result of the above factors, rather than a lack of high nature conservation value. This process of collating data is underway for some rivers and, together with further study and survey of several rivers proposed in forthcoming years, the data will assist the ability to identify high quality stretches of flowing water as SINC.

Key references are cited to provide further information where possible. The Rivers Swale and Ure have been assessed by NT Holmes for English Nature with respect to potential Sites of Special Scientific Interest status for certain stretches. Excerpts from the summary report are included within the two respective river descriptions with permission from English Nature.²⁸ There are SINC along the majority of rivers in North Yorkshire, some of which are directly associated with the river and other terrestrial sites that adjoin the river corridor. Species of importance, which are closely associated with the rivers of North Yorkshire, include significant populations of water vole and otter. Otters are known to occur on the Rivers Wharfe, Swale, Ure and Nidd. The River Foss is a stronghold for water voles and they also occur on the Wharfe, Swale, Ure and Nidd.

River Swale

The River Swale is a dynamic near-natural river, particularly in its middle reaches, which are characterised by active meandering and extensive shingle beds. The solid and drift geology of the River Swale shows great diversity. The Swale is noteworthy for having four main geological features present within a short stretch of river below Richmond; these are Carboniferous Limestone, Millstone Grit, Magnesian Limestone and Mudstones in the lower reaches. The drift deposits include a unique extensive area of glacial gravels and river terrace deposits in its middle reaches before it flows onto the lacustrine silts of the Yorkshire Plain. In addition to internationally important water crowfoot beds, other important features include riparian birds and invertebrates, for example, goosander and kingfisher, and carabid and click beetles. The river is important as a migratory route for fish, and a number of species are at or close to the northern edge of their British range within the Vale of York and Mowbray Natural Area, including barbel, bleak and ruffe. The riverbanks within the Vale of York and Mowbray are also of note as they are characterised by nationally uncommon and locally important species such as sand leek and field garlic. Colonies of yellow star-of-Bethlehem also occur on the riverside.

River Ure^{29 30}

The River Ure is almost completely natural for most of its course, nearly to its confluence with the River Swale, where floodbanks become the norm. The River Ure rises in the Yorkshire Dales National Park, flowing through Wensleydale and descends into the Vale of York before meeting the tiny Ouse Beck to become the River Ouse. Three main solid geological groups occur:

²⁸ Various authors for English Nature. 1982-1992. River Swale and River Ure. *Unpub.* Sections 2.6.1.1 & 2.6.1.2 include quotes from this work with permission from English Nature.

²⁹ Environment Agency. 2000. River Ure: Environmental Audit. Bullen Consultants Ltd.

³⁰ Environment Agency. 2000. River Ure: Geomorphological Audit. Report No. UV446/1.

Carboniferous Limestone notable around the Aysgarth Falls, Millstone Grits form a gorge like feature around Mickley passing into Magnesian Limestone downstream of West Tanfield. The Ripon Parks SSSI forms a major part of the latter section, here a major outcrop of Middle Marl (Permian) lies at the heart of this dynamic section. On this section the flashy nature of the river and sedimentation results in high levels of channel activity, with subsequent extensive shingle banks, islands and sandbanks.

This diverse geological mosaic results in a varied substrate of cobbles, boulders, sands and gravels, with subsequent varied flow types from waterfalls, cascades, rapids, riffles, runs and extensive glides. The Ure has excellent water quality throughout its length. It is important for migratory fish, notably Atlantic salmon and river lamprey, in addition to bullhead. The river is recognised as a Yorkshire stronghold for Otter. It supports white-clawed crayfish and water vole and an important range of riparian birds, such as kingfisher, dipper and little ringed plover. Invertebrate populations include nationally rare species, notably at Ripon Parks, in addition to nationally notable Crustacea. Riverbanks with their associated habitats include those species listed for the Swale plus marsh saxifrage (*Saxifraga hirculus*), Northern spike rush (*Eleocharis austriaca*), variegated horsetail (*Equisetum variegatum*), fingered sedge (*Carex digitata*), Swedish pondweed (*Potamogeton x suecicus*), slender-leaved pondweed (*Potamogeton filiformis*), bent moss and beck pocket moss. It also forms the national stronghold for the nationally rare thistle broomrape (*Orobanche reticulata*).

River Rye³¹

The River Rye drains a large watershed in the western North York Moors and Hambleton Hills and drains abruptly from these uplands into the western Vale of Pickering at Helmsley. The high energy load of the river entering a flat plain with very gentle gradients from west to east causes the river to migrate actively across the floodplain. The middle section of the Rye, between Helmsley and Ness, remains relatively unmodified and dynamic. This produces a riverine habitat of exceptional conservation quality; water quality is very good despite discharges from Helmsley sewage works and a fish farm, and the intermittent loss of flow between Helmsley and Sproxtun caused by swallow holes in the Jurassic limestone. The river contains complex pool and riffle sequences with occasional rapids, whilst erosion and deposition create features such as undercut cliffs and shingle banks. The middle reaches of the Rye support species and habitat features of European conservation concern, such as native white-clawed crayfish (between Helmsley and Nunnington), bullhead, otter and water-crowfoot beds.

The migratory nature of the Middle Rye has produced a wealth of morphological features such as river terraces, relict channels and oxbows. The latter are formed by the separation of incised meanders from the river channel and consist of sinuous depressions containing ponds and wetland vegetation. Some are well-defined horseshoe-shaped depressions, whilst others have a more complex patterning of winding hollows.

River Ouse

The River Ouse catchment drains approximately 1/5 of England through the River Humber and supports an important wetland resource of flood meadow or washlands. These flood meadows are important for grassland flora and often for wading birds and overwintering species. The banks of the River Ouse also support important invertebrate species, including the nationally scarce tansy beetle (*Chrysolina graminis*). North Yorkshire is a major stronghold for this species in England, although ongoing river engineering works may pose a threat to this species. The only other known current locality that supports a major population of tansy beetle is on the River Trent. The Environment Agency is currently commissioning an environmental audit of the Ouse similar to that undertaken for the Ure, which will enable further information to be included.

³¹ Hammond, M. 1999. Ecological Survey of the River Rye Oxbows. *unpub.* Quotes are taken from this work with permission from the author.

River Derwent

The River Derwent is well known for its internationally important flora and fauna. The Derwent is both an upland and lowland river in North Yorkshire, although most of the upland stretches lie within the North York Moors National Park. Downstream of the Hertford confluence, the Derwent supports plant communities that are characteristic of southern rivers. Several species are present that are close to the northern limit of their British range. In areas of high flow, river water-crowfoot provides a distinctive and important feature of this river system. Riparian habitats on the River Derwent are important for invertebrates, including nationally rare species. Recent ecological studies of the Vale of Pickering³² have indicated that the Derwent supports a range of fauna that rely upon clean waters and are good biological indicators of water quality. These include white-clawed crayfish (present between West Ayton and Sherburn), mayflies on the middle Derwent and a nationally scarce alderfly recorded from the Derwent at Norton.

In the Derwent catchment there are eight streams that originate from the chalk of the Yorkshire Wolds. They are not strictly classified as chalk streams in the UK Biodiversity Action Plan for Chalk Rivers as they are atypical of this habitat. They are unusual because, although they originate from the base of the chalk of the Yorkshire Wolds, they subsequently mainly flow over clay surfaces and non-chalk geology. Despite this they do retain some of the character of chalk streams. Settrington Beck, in particular, supports water-crowfoot beds, a habitat type listed in Annex 1 of the EC Habitats Directive³³.

These streams are significant features of North Yorkshire. They have clear calcareous waters with associated species such as water-cress (*Rorippa nasturtium-aquaticum*) and blue water speedwell (*Veronica anagallis-aquatica*).³⁴ Streams at Wharram-le-Street to Settrington and Wintringham support particularly significant assemblages of chalk stream flora.

River Wharfe³⁵

The Wharfe rises in the Northern Pennines close to Ribbleshead, flows through the Yorkshire Dales National Park to Bolton Abbey estates and downstream to Tadcaster, and drains into the Ouse east of Ryther. It is a good quality river and is given a B grade in the national Invertebrate Site Register. The native white-clawed crayfish, which is listed in the EC Habitats Directive, is present along the Wharfe in the Pennine Dales Fringe Natural Area, although the American signal crayfish is also present which may affect the native populations. Fish populations are generally of high quality and reflect the good water quality. Trout occur from the upper reaches within the Yorkshire Dales National Park downstream to Wetherby, and grayling are found further downstream to Tadcaster. The Wharfe itself is an SSSI for 4.4 miles from Buckden to Kettlewell supporting kingfisher and dipper, and the nationally rare northern spiked rush (*Eleocharis austriaca*). The middle sections of the Wharfe support several SSSIs for geological, botanical and avian interest. In the lower catchment the valley largely comprises farmland, it is wide and flat and the nature conservation interests are more fragmentary. In West Yorkshire, the Wharfe has been designated a SINC where it joins North Yorkshire. The Environment Agency is likely to commission an environmental audit for this river as with the Rivers Ure and Ouse.

River Esk

³² Hammond, M. 1998. The Wetland Wildlife of the Vale of Pickering: Notable Species and Changes in Flora and Fauna. Vale of Pickering Wetlands Project: Phase Two Interim Report. PLACE Research Centre, 1999 The University College of Ripon & York St John.

³³ Selman, R., F. Dodd and K. Bayes (1999) A Biodiversity Audit of Yorkshire and the Humber. Yorkshire and Humber Biodiversity Forum

³⁴ Weston, A. (1996). Derwent Catchment Chalk Stream Survey. Environment Agency (York).

³⁵ Environment Agency. 1997. Nidd & Wharfe Local Environment Agency Plan. Environment Agency.

The River Esk and its estuary is wholly designated as a SINC within North Yorkshire; for further information refer to the SINC citation for this site and to the coastal section of this document for details of the estuarine flora and fauna.

River Nidd³⁶

The Nidd rises at Nidd Head at the edge of the Yorkshire Dales National Park and a large proportion of the Upper Nidd and Washburn river valleys fall within the Nidderdale Area of Outstanding Natural Beauty. The River Crimple joins the Nidd at Walshford and the river flows east to the River Ouse at Nun Monkton several miles upstream of York. The Nidd supports a good water quality and is another important migratory route for fish. Trout occur from the upper reaches to Knaresborough and grayling are found downstream to Tockwith. The Environment Agency considers that some natural trout recruitment may occur within the Nidd. The upland sections of the Nidd include a number of SSSIs, all of which are closely associated with the river. The avian interest of the Nidd is significant. There are a large number of SINC's associated with the Nidd that are designated for their flora and fauna.

River Foss

The Foss is a tributary of the River Ouse and is known to be a stronghold for water vole (Martin Fuller, *pers. comm.*). In general, the river water quality is poor. The Foss is closely linked with the history of the City of York and is of significance for its archaeological and historical value.

Important flowing water habitat is found within most major Natural Areas within North Yorkshire. Table 23 lists key rivers and streams in the county by Natural Area.

Table 23 Key rivers and other watercourses

Natural Area	Rivers and other water courses
Humberhead Levels	River Derwent, River Ouse, River Foss and River Aire
Vale of York & Mowbray	River Ouse, River Derwent, River Wharfe and River Swale
Pennine Dales Fringe	River Wharfe, River Ure, River Swale, River Nidd and River Tees
Yorkshire Wolds	Calcareous stream tributaries of the Derwent including Settrington and Wintringham Becks. There are at least 7 other calcareous streams in the Yorkshire Wolds.
Southern Magnesian Limestone	River Wharfe, River Nidd and River Ure.
Vale of Pickering	River Derwent and River Rye and their major tributaries.
Yorkshire Dales	River Nidd
North York Moors and Hills	River Rye, River Derwent and River Esk

³⁶ Environment Agency. 1997. Nidd & Wharfe Local Environment Agency Plan. Environment Agency.

2.6.2 Selection Criteria and Attributes

Table 24 Selection criteria and attributes for flowing water SINC

CRITERION	ATTRIBUTE
Size	No minimum size for length. A recognisable management unit defined by physical features on the ground. Ideally, in the long term, 500m standard lengths based upon River Habitat Survey (RHS)/River Corridor Survey (RCS). Width minimum 0.5m from wetland margin – wetland margin.
Rarity	The presence of internationally important plant species. The presence of nationally rare or declining plant species; presence of regionally important species; presence of locally rare or declining plant species or species/communities of restricted distribution that have a population stronghold in North Yorkshire. The presence of a rare habitat type at international-local level.
Diversity	The diversity of hydromorphological features as defined by RHS methodology The diversity of NVC types and plant and animal species.
Naturalness	The presence of features associated with natural rivers such as oxbows, riffles, pools, gravel shoals/shingle, sand bars. Evidence of active meandering.
Representativeness	The presence of nationally important river types as defined by RHS or methodology developed by Nigel Holmes “Typing British Rivers According to their Flora.” Comparison of the observed characteristics of the river with Biological General Quality Assessment (includes BMWP & RIVPACS) of what might be expected.
Position in an ecological unit	The proximity to other habitats including wetlands. Known migration route for wildlife including fish.

2.6.3 General application of Flowing Water guidelines

These guidelines may be applied to all rivers and streams. The extent of the riverine or stream habitat included should be in accordance with the definition given for rivers and streams in the UK Biodiversity Action Plan:

“This type includes rivers and streams from bank top to bank top or where there are no distinctive banks or banks are never overtopped, it includes the extent of the mean annual flood. This includes the open water zone which may contain submerged, free floating or floating-leaved vegetation, water fringe vegetation and exposed sediments and shingle banks.”

In the immediate future a recognisable management unit will be used to define SINC boundaries, as defined by physical features on the ground e.g. bridges or field boundaries.

In the long term, the assessment of rivers of SINC quality would ideally be made against pre-determined 500 metre long sections of river measured from permanent in-river structures, such as a weir or tidal barrier. These 500m stretches would be as determined by the Environment Agency according to standard River Habitat Survey methodology. At present, however, it is not possible to assess riverine SINC on that basis and therefore boundaries will be determined as specified in the previous paragraph.

2.6.4 Flowing Water Selection Guidelines

Watercourses or sections of watercourses will be eligible for selection as a SINC if they satisfy one of the following guidelines.

Guideline

Fw1

A stretch of river or smaller water course that supports 2 or more of the following a) – d):

(a) regularly supports a high and/or near natural water quality as determined by Biological General Quality Assessment methodology used by the Environment Agency,

(b) a suite of 3 or more natural river habitat features that should normally occur in the stretch of watercourse being evaluated from those listed below:

**Cascades (Waterfall)
Islands
Oxbows
Pools
Rapids
Riffle and run systems
River cliffs (earth or rock)
Sand or mud banks
Shingle banks/gravel shoals
Unmodified bank profiles
Unvegetated point bars
Vegetated point bars
Accumulations of coarse woody debris**

(c) a score of 12 or more from the species listed in Table 25,

(d) significant water-crowfoot beds

Application

See general application of guidelines.

Rationale

Unmodified near natural watercourses, especially rivers support a greater diversity of plant and animal species than watercourses that have been physically modified and have a degraded quality of water. Natural watercourses are important reservoirs of biodiversity and a rare habitat nationally.

Guideline

Fw2

Any stretch of river that is identified as a high quality representation of its type, as specified within the Vegetation Communities of British Rivers³⁷ classification system.

Application

This should be applied to stretches of river usually of 1km or more in length, as this is the standard length used by the classification system. Key river types & sub-communities within North Yorkshire are III(b), V(a), V(b), VI(a) and VIII(c). This should not be applied to rivers of Types II or IV as these indicate impoverished river plant communities. Liaison with Environment Agency ecologists and biologists will be valuable to assess riverine sites using this guideline.

Rationale

Rivers observed to be representative of their national type are valued as true examples of the expected river quality for the respective environmental conditions local to the river corridor, such as geology and geomorphology etc. They reflect primary criteria, including representativeness, diversity and naturalness. Good examples of high quality rivers are scarce within England, as many rivers no longer occur in their natural state due to various man-induced physical or chemical modifications. Unmodified near natural watercourses, support more characteristic plant and animal species than those watercourses which have been physically modified and have a degraded quality of water.

Guideline

Fw3

Any stream originating from calcareous substrata in the Yorkshire Wolds Natural Area that supports 4 or more species of characteristic calcareous stream flora shown in Table 25 and/or a characteristic calcareous invertebrate fauna as verified by an invertebrate ecologist.

Application

See general application guidelines and guidelines for the selection of invertebrate SINC's in part B.

Rationale

Calcareous streams are a rare habitat in North Yorkshire restricted to the Yorkshire Wolds and as such, are a rare type of flowing water in the county. However, the quality of these watercourses is also important and this guideline seeks to identify those chalk streams with a characteristic range of plants and animals that indicate a good quality watercourse. Unmodified near natural watercourses, support a greater diversity of plant and animal species than those physically modified and with a degraded quality of water. Natural watercourses are important reservoirs of biodiversity. Certain stretches of the Wolds calcareous streams exhibit chalk stream characteristics, which is a UK Biodiversity Action Plan habitat that is assigned both national and international importance (under the EC Habitats Directive).

³⁷ Holmes, Boon, Rowell. 1999. Vegetation Communities of British Rivers: A Revised Classification. Joint Nature Conservation Committee.

Table 25 Flowing water vascular plants

<u>Scientific name</u>	<u>Common name</u>	<u>Calcareous stream species</u>
<i>Alisma lanceolatum</i>	narrow-leaved water plantain	
<i>Alisma plantago-aquatica</i>	water plantain	
<i>Apium nodiflorum</i>	fool's water-cress	
<i>Berula erecta</i>	lesser water-parsnip	*
<i>Butomus umbellatus</i>	flowering rush	
<i>Callitriche spp</i>	any water-starwort	*
<i>Carex acutiformis</i>	lesser pond sedge	
<i>Carex paniculata</i>	great tussock sedge	*
<i>Carex riparia</i>	greater pond sedge	
<i>Ceratophyllum demersum</i>	rigid hornwort	
Charophytes	any stonewort species	
<i>Eupatoria cannabinum</i>	hemp agrimony	
<i>Glyceria notata</i>	plicate sweet-grass	*
<i>Groenlandia densa</i>	opposite-leaved pondweed	*
<i>Hippuris vulgaris</i>	mare's-tail	*
<i>Hottonia palustris</i>	water violet	
<i>Iris pseudacorus</i>	yellow flag	
<i>Lythrum salicaria</i>	purple loosestrife	
<i>Mentha aquatica</i>	water mint	
<i>Myosotis scorpioides</i>	water forget-me-not	
<i>Myosotis stolonifera</i>	pale forget-me-not	
<i>Myriophyllum alterniflorum</i>	alternate water-milfoil	
<i>Myriophyllum spicatum</i>	spiked water-milfoil	
<i>Myriophyllum verticillatum</i>	whorled water-milfoil	
<i>Nuphar lutea</i>	yellow water lily	
<i>Nymphaea alba</i>	white water lily	
<i>Oenanthe fluviatilis</i>	river water dropwort	
<i>Phragmites australis</i>	common reed	
<i>Potamogeton crispus</i>	curled pondweed	
<i>Potamogeton friesii</i>	flat-stalked pondweed	
<i>Potamogeton lucens</i>	shining pondweed	
<i>Potamogeton natans</i>	broad-leaved pondweed	
<i>Potamogeton pectinatus</i>	fennel pondweed	
<i>Potamogeton perfoliatus</i>	perfoliate pondweed	
<i>Ranunculus fluitans</i>	river water crowfoot	*
<i>Ranunculus penicillatus ssp. pseudofluitans</i>	stream water-crowfoot	*
<i>Ranunculus spp. (aquatic)</i>	other water-crowfoot species	*
<i>Rorippa amphibia</i>	great yellow-cress	
<i>Rorippa nasturtium-aquaticum</i>	water-cress	*
<i>Rumex hydrolapathum</i>	water dock	
<i>Sagittaria sagittifolia</i>	arrowhead	
<i>Schoenoplectus lacustris</i>	bulrush	
<i>Schoenoplectus tabernaemontani</i>	grey club-rush	
<i>Sparganium emersum</i>	unbranched bur-reed	
<i>Veronica anagallis-aquatica</i>	blue water speedwell	*

Habitat Selection Guidelines

2.7 Coastal Habitats

In North Yorkshire, habitats associated with the coastal zone outside the North York Moors National Park can be classified as either, maritime cliff and slope or estuary. These habitats all occur within the Saltburn to Bridlington Maritime Area but overlap, on the landward side, with the Vales of Pickering and North York Moors and Hills Natural Areas.

2.7.1 Maritime Cliff and Slope

Maritime cliffs and slopes are dynamic systems with new cliffs and slopes being created by land slippage or erosion by the action of the sea. The type of cliff and slope formed is influenced by a variety of factors including, the nature of the underlying bedrock and superficial deposits, and the manner by which these are eroded. These natural processes, combined with the soils and the maritime influence of salt spray, strongly influence the type of habitats that have developed. These habitats, especially the grasslands, heaths and scrub, can be considered as some of the most natural habitats remaining in the UK.

The UK Biodiversity Action Plan for Maritime Cliff and Slope states that there is an estimated 4000km of coastline cliffs. Almost all of the coastline north of the Humber estuary can be classed as sea cliff. In North Yorkshire (excluding the North York Moors National Park) this resource is comprised of soft and hard cliffs and is confined to the District of Scarborough. It is estimated that there is almost 18 kilometres of sea cliff in the District.³⁸

The coastline is almost a continuous length of semi-natural grassland, scrub and cliffs interrupted only by the settlements of Scarborough, Filey, Whitby and Sandsend. Other habitats are also present adding significantly to the diversity of plant and animal species. These habitats include sandy beach, wave-cut platform, hard cliff, fen, flush, mire, scrub, woodland and heath.

The majority of cliff and slope zone is designated as geological and/or biological Sites of Special Scientific Interest. Those areas outside SSSIs also support good quality habitat, which together with the SSSIs, make up a single unit of coastal habitats. The grasslands are considered to be the most natural within North Yorkshire with the possible exception of some ungrazed ledges in the Yorkshire Dales National Park. In 1998, the North Yorkshire Key Habitats Survey recorded a very high diversity of vascular plant species from the coastal habitats. The area is almost totally ungrazed except by rabbits and deer. Many uncommon or localised plants have been recorded and the area supports large populations of saw-wort (*Serratula tinctoria*), grass-of-Parnassus (*Parnassia palustris*), wood vetch (*Vicia sylvatica*), bloody cranesbill (*Geranium sanguineum*) and at least 6 species of orchid. The rare and declining bithynian vetch (*Vicia bithynica*) is also recorded.

The plant communities of the sea cliffs of North Yorkshire are locally distinctive. They do not correspond closely with community descriptions in the published volumes of the National Vegetation Classification. This probably results from the minimal maritime sampling between Durham and Essex during the compilation of the classification. In addition, many of the vegetation stands in North Yorkshire are intermediate between coastal and inland grassland communities and classification is further complicated by the variety of soils and the natural processes which influence the nature of the coastal environment. For these reasons, it is thought that some elements of the maritime cliff and slope habitats may be unique.

³⁸ Selman, R., F. Dodd and K. Bayes (1999) A Biodiversity Audit of Yorkshire and the Humber. Yorkshire and Humber Biodiversity Forum.

Other biotic groups are also highly significant, with important assemblages and individual species of invertebrates having been recorded, including nationally scarce ground beetles. The coastal habitats are also of importance for birds, particularly seabirds at locations such as North Filey cliffs.

2.7.2 Estuarine Habitats

There is only one estuarine system within North Yorkshire, which is the Esk Estuary in the District of Scarborough. It is estimated there are 9 ha of intertidal mudflats and 7.5 ha of muddy sand and estuarine mud.³⁹ The estuary also supports areas of saltmarsh and brackish and freshwater swamp and fen. Although the area of saltmarsh is small it is the only coastal saltmarsh habitat in the county.

2.7.3 Selection Criteria and Attributes

Table 26 Selection criteria and attributes for coastal habitat SINCs

CRITERION	ATTRIBUTE
Size	The area of site and continuity of coastline.
Naturalness	The presence of habitat due to obvious natural processes such as landslip, wave action, salt spray and lack of grazing. The presence of indicator species of long established and ancient habitats.
Diversity	The number of vascular plants and other species recorded. The number of habitats and plant communities.
Rarity	The presence of nationally, regionally or locally rare or declining species. Rarity of habitat in North Yorkshire and the region, particularly estuary.
Representativeness	The presence of characteristic and/or locally distinctive species assemblages.
Fragility	Evidence of factors that affect the integrity of the site such as coastal erosion, agricultural improvement, pedestrian erosion, fly-tipping and tourism developments on landward side. The presence of alien & invasive species.
Position in an ecological unit	Continuity of habitat, formation of strategic wildlife corridor, adjacent to and contiguous with SSSIs and a range of habitat types.

³⁹ Selman, R., F. Dodd and K. Bayes (1999) A Biodiversity Audit of Yorkshire and the Humber. Yorkshire and Humber Biodiversity Forum

2.7.4 Coastal Habitat Selection Guidelines

Sites that satisfy any one of the following guidelines will be eligible for designation as a SINC.

Guideline

Co1

Areas of 0.5ha or more of natural and semi-natural habitat of the coastal fringe of North Yorkshire.

Application

This guideline applies to all areas of natural and semi-natural habitat associated with coastal processes, including maritime hard and soft cliffs and slopes, maritime cliff and coastal grassland and associated scrub, fen, flush, woodland, sandy beach.

Rationale

The coastal fringe supports a large area of entirely natural and semi-natural habitat in North Yorkshire and occurs only in the Scarborough Borough Council administrative area. As such all areas of undeveloped habitat are considered to be of nature conservation interest for the plant and animal communities they support, as they collectively form a continuous coastal complex of at least regional importance and support examples of rare habitats in the county.

Guideline

Co2

Areas of natural and semi-natural habitat in the Esk estuary listed below.

- (a) Intertidal mudflat.**
- (b) Brackish and freshwater fens and swamp.**
- (c) Saltmarsh.**

Application

This guideline should only be applied to the estuarine area of the River Esk. Any designation should extend to include the intertidal areas.

Rationale

The estuarine habitats of the River Esk are some of the most natural habitats in North Yorkshire. As such, the mosaic of estuarine habitats should be considered as a single ecological unit. This is the only estuarine system in the county.

Habitat Selection Guidelines

2.8 Habitat Selection Guidelines for Upland Moorland Habitats

This habitat typically comprises the unenclosed ground lying above the 'moor wall' (usually at 250-300 metres above sea level). The vegetation is characterised by dwarf shrubs, in particular heather, and the typical land uses are grouse moor and extensive sheep grazing. Two major habitat types dominate upland moorland: upland heath and blanket bog. Other habitat types also occur, including upland acid grassland, scrub, bracken beds, springs, flushes and streams. Some of these are covered by other selection guidelines.

In areas of higher rainfall and/or on gently sloping ground, blanket bog communities have developed on an accumulated peat layer greater than 50cm in depth. Blanket bog supports dwarf shrubs, but is characterised by the presence of cotton grasses, *Sphagnum* mosses and bog pools.

In areas of lower rainfall and/or more steeply sloping ground, blanket bog gives way to drier upland heath, which is dominated by dwarf shrubs including ling heather, bell heather and bilberry. Upland heath develops on peaty podsols or on shallow peat deposits that are less than 50cm in depth. Upland heath often occurs in a mosaic with acid grassland, especially around the lower margins of the moorland where relatively high grazing pressure has led to the loss of dwarf shrub communities.

There are UK Biodiversity Action Plans for both Upland Heath and Blanket Bogs. These plans indicate a large proportion of the European Community resource is found within the UK. Upland heath is almost entirely confined to the western seaboard of Europe, and the UK has an important role in the conservation of this internationally rare habitat.

In North Yorkshire, virtually all the blanket bog and upland heath communities in the county fall within the Yorkshire Dales and North York Moors Natural Areas. Together these two areas support about 150,000 hectares of moorland, of which approximately a half to two-thirds is heather dominated.

The vast majority of this resource lies inside one of the two National Parks, both of which lie outside the administrative area of North Yorkshire County Council. Of the remaining area (about 30,000ha), virtually all is restricted to the three most westerly districts, of Richmond, Harrogate and Craven, although a small amount also occurs in Ryedale District. In the west of the county, moorland occurs as a fringe lying along the eastern and southern flanks of the Yorkshire Dales National Park. Harrogate contains the greatest extent of moorland (c20,000ha), however, in this case, much of this land is designated as SSSI. It is intended that these areas will also form a part of the North Pennines Special Protection Area along with moorland areas inside the National Parks.

Areas of moorland habitat, which lie outside the National Parks and beyond the boundaries of statutorily designated sites, are eligible for SINC evaluation. In Craven District, moorland is restricted in the south-eastern corner to areas below the A56 and A59, and in the south-western corner, to Burn Moor. In Harrogate District there are areas of moorland between Lofthouse and Great Whernside. There are also small areas in the Washburn Valley. In Richmond, moorland occurs on the western flank of the District north of the River Swale; and much smaller areas occur near Leyburn. This area also has large areas of degraded grass-dominated moorland on the Catterick and Feldon military ranges.

All these areas are predominantly used for sheep grazing and in many cases grouse shooting. A combination of these uses has existed for at least the last two centuries, though the former has become increasingly intensive (especially in the last 50 years), and the latter increasingly commercial. In addition, lead mining started, flourished and disappeared, especially in the north of the county, though in parts the uplands remain peppered with old mine shafts and spoil heaps.

Such sites are considered under other selection guidelines.

The increasing number of sheep has been mirrored by a decreasing level of stock management, particularly in terms of shepherding. The result is that, even where stock numbers remain relatively low (such as on the grouse moor estates), there can be significant localised over-grazing around winter stock-feeding sites, or more widespread grazing pressure on the lower edge of the moor.

In addition, the increasing commercialisation of grouse moor management may have led to increased levels of heather burning in an effort to make the moor more productive. This may in turn have led to a decrease in the diversity of dwarf shrubs on open moorland, and the development of heather monocultures. This effect may, in part, be balanced by decreasing numbers of gamekeepers involved in heather burning activities.

The balance of all these factors varies enormously, even on adjacent moorland blocks or estates. Where grouse shooting has ceased the result is usually increasing sheep numbers and the loss of heather-dominated moor to grass-dominated 'white moor'. Where grouse moor management remains in place, the effect of grazing pressure may be negligible or non-existent. In wetter areas or where manpower is very short, there may be abandonment of management on the top of moors with concomitant pressure on the lower and/or drier areas.

The moorlands in the Catterick area are used for military training. The conservation duties of the Ministry of Defence are taken very seriously with positive results for the quality of upland habitats. However, recent beneficial changes follow several decades when these responsibilities simply did not exist or were considered as very much secondary to agricultural or other land uses. The result has been that large areas of the military estate are now white moor.

2.8.1 Selection Criteria and Attributes

Table 27 Selection criteria and attributes for upland moorland SINC

CRITERION	ATTRIBUTE
Size	The area of site and continuity of moorland. The extensive nature of moorland habitats is intrinsic to their value.
Naturalness	The diversity of dwarf shrub species. The proportion of moor covered by mature or over-mature heather. The occurrence of woodland existing or re-establishing. The extent of drainage grips. The occurrence of natural wetland features such as springs and flushes. The occurrence of lichen and bryophyte assemblages beneath the dwarf shrub canopy. The absence of industrial artefacts, such as lead-mine spoil heaps.
Diversity	Diversity of habitat structure. Diversity of characteristic species assemblages.
Rarity	The presence of rare mire, bog, flush and heath plant communities. The presence of rare species.
Representativeness	The presence of characteristic species assemblages.

CRITERION	ATTRIBUTE
Position in an ecological unit	The continuity of habitat, formation of strategic links between SSSIs and a range of other habitat types

2.8.2 General application of Upland Moorland Guideline

The following guideline should be applied to moorland habitats on unenclosed land above the 'moor wall' (250-300 metres). No definitive minimum size can be set; though in all likelihood small areas of upland heath would not be appropriate, as they are unlikely to support the ecosystems that make upland habitats 'special'. A guideline threshold of 400 ha has been provided, but consideration should be given to the inclusion of smaller areas that form coherent topographic units. Consequently, the guideline should be applied to the quality of habitats, within the context of an identifiable block of moorland. In many cases, it may make sense to lump adjacent moorland blocks together, because it is the extensive nature of open moorland that makes upland habitats 'special'.

When assessing potential moorland SINC, as well as considering the extent and geographical and topographical situation of the moor block, consideration should be given to the quality of the moorland habitats over the majority of the site. Areas supporting significant cover of habitats and species characteristic of ecological degradation should not be selected.

2.8.3 Upland Moorland Selection Guidelines

Upland moorland sites that meet the following guideline will be eligible for designation as a SINC.

Guideline

Mo1

Large areas of dry heath, wet heath or blanket bog habitat (typically represented by NVC types H4, H8, H9, H10, H12, H18, H21, M15, M16, M17, M18, M19, M20, M25), which either individually or in combination normally exceed 400 ha in size and form a coherent topographical unit.

Application

This guideline should be applied to large sites (normally greater than 400 ha) that meet the quality guidelines⁴⁰ set out in Table 28. To qualify a site must meet the essential quality guidelines and one of the desirable quality guidelines.

Rationale

This guideline seeks to identify large areas of upland moorland habitat which form coherent topographical features and are not adversely affected by poor burning practices or over grazing. The NVC communities listed in the guideline are those that represent high quality moorland habitat.

⁴⁰ Adapted from English Nature SSSI Condition Assessment Tables for Upland heath.

Table 28 Quality Guidelines for the selection of moorland SINC

Dry heath	Essential Quality Guideline
	Minimum of 50% dwarf shrub cover.
	At least 2 species of dwarf shrub should be widely distributed.
	Desirable Quality Guidelines
	A maximum of 20% of the site showing signs of current heavy grazing.
	All age classes of <i>Calluna</i> present with at least 10% in the mature/degenerate age class.
	Bryophytes (excluding <i>Polytrichum spp.</i> and <i>Campylopus spp.</i>) and/or <i>Cladonia spp.</i> lichens should be at least occasional.
Wet heath	Essential Quality Guideline
	Minimum 10% cover of species other than dwarf shrubs.
	Total cover of graminoids should not exceed 50%.
	At least 2 species of dwarf shrub should be widely distributed.
	Desirable Quality Guidelines
	A maximum of 20% of the site showing signs of current heavy grazing.
	All age classes of <i>Calluna</i> present with at least 10% in the late mature/degenerate age class.
	Bryophytes (excluding <i>Polytrichum spp.</i> and <i>Campylopus spp.</i>) and/or <i>Cladonia spp.</i> Lichens should be at least occasional.
Blanket Bog	Essential Quality Guideline
	Minimum 20% dwarf shrub cover (except where <i>Sphagnum</i> abundant and forming lawns).
	At least 2 species of dwarf shrub should be widely distributed.
	Total cover of graminoids should not exceed 60% unless <i>Sphagnum spp.</i> are abundant/co-dominant and forming lawns below the grassland (i.e. in waterlogged conditions).
	Bryophytes (excluding <i>Polytrichum spp.</i> , <i>Campylopus spp.</i> And <i>Racomitrium lanuginosum</i> on bare ground) should be at frequent and must include <i>Sphagnum spp.</i>
	Desirable Quality Guidelines
	Little bare ground or ground cover with <i>Racomitrium lanuginosum</i> , <i>Polytrichum spp.</i> <i>Campylopus spp.</i> Crust forming lichens or algal mats.
	No erosion other than in localised instances and no current peat abstraction.
	A maximum of 20% of the site showing signs of current heavy grazing.

Habitat Selection Guidelines

2.9 Habitats on artificial substrates

These guidelines relate to specific habitats created as a result of past human industrial activity followed by natural colonisation of plants and animals. Post-industrial land can support a wide variety of habitats and species, which can be of significant nature conservation value. These habitats support assemblages characteristic of the conditions created by the artificial origin of the site. They are usually associated with post-industrial sites on which a variety of artificial substrates have been deposited or naturally occurring material disturbed.

Plant communities of post-industrial habitats can be highly susceptible to succession and it is often the early stages of succession that are of highest ecological value. Grassland, scrub and secondary woodland communities, however, also make a valuable contribution to the importance of post-industrial habitats. Other habitat guidelines may be more appropriate than this section for a site, which is dominated by habitats that closely resemble natural and semi-natural plant and animal communities.

In the early stages of natural colonisation of post-industrial sites ephemeral or transitory species and communities are favoured which can include many uncommon species of invertebrates, such as Hymenoptera (bees and wasps) and carabid beetles. Later stages of succession, however, can also be important for rare and threatened species.

Many post-industrial sites support a wide range of edaphic conditions, from exposed natural substrates to deposited artificial material. These substrata can vary in nutrients and chemical reaction. They can also support a wide spectrum of hydrological conditions from open water to dry ground. Consequently, post-industrial sites can be particularly rich in species reflecting the complex mixture of habitat type, soils, hydrology and vegetation structure.

These guidelines apply to sites comprising pulverised fuel ash settlement lagoons, cinder beds of railway sidings, and former lead mine spoil and wastes with high concentrations of heavy metals and other elements. Depending on how long some of these post-industrial sites have been abandoned they may have become part and parcel of the landscape; for example, metalliferous plant communities on old lead mining spoil. The higher and lower plant communities of these metalliferous sites are unique and support a highly characterised flora.

Pulverised fuel ash lagoons

Pulverised fuel ash (PFA) is a waste material from coal burning power stations. PFA is used in part by the construction industry, but the rest is either deposited in settlement lagoons or mounds near to the power stations. There are several PFA "sites" within the Selby Coalfield which support developing nature conservation interests.

Studies of PFA across England indicate consistencies in the developing vegetation, plant communities and structure.⁴¹ Shaw states that on dry PFA that is allowed to naturally colonise, there is evidence of succession starting with pioneer & ruderal plant communities. After 10-15 years a willow – birch dominated scrub develops with orchids being one or more of the dominant forb species and at 20 – 25 years a willow-birch woodland develops joined by seedlings of oak and hawthorn. It is thought that the oak and hawthorn may be important factors for the climax vegetation.

⁴¹ Shaw, P J A. (1992). A preliminary study of successional changes in vegetation and soil development on unamended fly ash (PFA) in southern England. *In*: Journal of Applied Ecology. (1992).

The colonising nature conservation interests are often also important for their diverse avifauna and invertebrates; rare species of flora and fauna have been recorded at various sites in the country, although it is not known if there are such records held for the PFA sites in North Yorkshire. One of the interesting and distinctive features of PFA is the colonisation and hybridisation of orchid species often resulting in large populations at a given site.

Railway cinder beds

Vacant post-industrial land is scattered throughout the main urban centres of the county at Selby, Harrogate, Ripon, Scarborough, Northallerton and Thirsk and is frequently associated with railway corridors. A common vegetation community of railway cinder beds is that of rat's tail fescue (*Vulpia myuros*), squirrel-tail fescue (*Vulpia bromoides*) – wild mignonette (*Reseda lutea*). This community appears to be specifically restricted to the track beds of active and disused railway lines and sidings. It typically develops on the hot, dry cinder beds of the tracks, which are low in organic content, free draining and often subject to summer parching. A uniform fine sward of rat's tail fescue with squirrel-tail fescue, tall herbs and a wide range of common or locally rare ruderal plants dominate the vegetation. Cinder beds often support this community as part of a mosaic comprising open bare ground, birch, buddleia and hawthorn scrub, tall herb communities and coarse grassland.

Lead mine wastes

Lead mines occur in various locations within the uplands and are associated with the alkaline, limestone environment of the North Pennines. In North Yorkshire, former lead mining habitats are concentrated in lower Wensleydale and Nidderdale, including around Greenhow and Bewerley in the Harrogate District. Ministry of Defence land on the Catterick estate in the Richmond District also supports similar communities. Abandoned mines are complex places incorporating metalliferous waste spoil heaps, collapsed shafts, tunnels, building ruins etc.⁴² Spoil heaps may be associated with adits or randomly deposited. Gilbert (2000) indicates that the alkaline mines of the Northern Pennines were among the first to be studied in great detail. He notes that some of the spoil heaps have been re-worked in the 1980's for their fluorspar and barytes leaving a combination of old and more recently disturbed areas. Those areas more recently disturbed can have higher levels of toxicity than those which have not been disturbed, as there has been less time for toxic elements and compounds to leach from the spoil surface.

These former lead mining areas have been colonised over the years by characteristic plant communities of lead wastes including nationally scarce species such as spring sandwort (*Minuartia verna*) and a number of specialist and rare metallophyte lichens. The principal plant community has been described in the NVC – the OV37 *Festuca ovina* – *Minuartia verna* community.

⁴² Gilbert, O. (2000). Lichens. HarperCollins, London.

2.9.1 Selection Criteria and Attributes

Table 29 Selection criteria and attributes for artificial habitat SINC

CRITERION	ATTRIBUTE
Rarity	The presence of locally rare or declining plant species or hybrids. The presence of species/communities of restricted distribution.
Diversity	The presence of a high species diversity. The presence of high structural diversity. The presence of high habitat diversity. The presence of varied topography, substrate type and hydrology.
Position in an ecological unit	The location or proximity of site in relation to other recognised site/s of interest either as similar habitat or habitat mosaic. The location lies within identifiable wildlife corridor as defined by PPG9.

2.9.2 General application of Artificial Habitat Guidelines

These guidelines should be applied to sites supporting habitats of artificial origin, which do not closely resemble natural or semi-natural habitat types. Those habitats that do closely resemble their natural and semi-natural counterparts should be assessed against the appropriate guidelines. In certain instances, however, these semi-natural habitats may be incorporated within a site that qualifies under this section. This is where they do not dominate the site as a whole but contribute to the overall ecological value and enhance the value of the site for its specialist species. For example the vegetation may aid the life cycle of invertebrate species groups for which a site may also be notable (such as provision of a necessary food source or egg laying habitat, or aid pupation).

Grassland and other communities occurring on natural substrates exposed by man in, for example, railway cuttings or disused quarries, would normally be assessed using the grassland or other selection guidelines where appropriate. Other plant communities that have developed on man-made materials should be assessed under these guidelines. Where there is some doubt, the habitat should be examined under both the artificial habitat guidelines and the other habitat selection guidelines.

Industrial processes often result in the formation of large water bodies. Such sites, indirectly created by aggregate extraction, should be assessed under the standing water selection guidelines. Disused dry quarries should be assessed under the appropriate grassland or other habitat selection guidelines.

Any remnant semi-natural habitat within such sites (such as woodland, wetland, or grassland) should also be assessed under the relevant habitat or habitat mosaic selection guidelines.

2.9.3 Artificial Habitat Selection Guidelines

Any habitats that meet one of the following guidelines will be eligible for selection as a SINC.

Guideline

Ar1

A former lead mine or waste disposal site of at least 0.25 ha total area that scores 5 or more from the species listed in column Ar1, Table 30.

Application

This guideline should be applied to former lead mining areas and wastes only. Sites selected should normally have a good distribution of mine waste communities throughout the site. This applies to series of botanically important spoil heaps occurring in a linear form along a mineral vein complex or an assemblage of spoil heaps that form part of an identifiable ecological unit. Consequently, a single, isolated small mine tip in the middle of an improved pasture would not normally qualify for selection.

Rationale

These post-industrial habitats support unique plant communities that show a close association with metalliferous habitats. A report published by the Department of the Environment⁴³ showed that lichens exhibit the closest association with metalliferous habitats in comparison with any other metallophytes. Some of the species typical of this habitat are nationally or locally scarce or rare.

Guideline

Ar2

Railway cinder beds of 0.25ha or more in size scoring 10 or more from the species listed in column Ar2, Table 30.

Application

This guideline should be applied to former or disused railway cinder beds only. This may be in combination with secondary semi-natural habitats such as woodland (often equates to W16), scrub and grassland. These habitats add to the overall nature conservation value of the site and represent the natural process of succession in this man-made environment.

Rationale

Railway cinder beds support distinctive vegetation communities due to low organic nutrient levels and physical conditions. North Yorkshire does not support large areas of disused or former railway sidings and hence this habitat is localised within the county.

Guideline

Ar3

A site of former PFA settlement lagoon or tip that supports over 100 flowering spikes of an orchid species and hybrid orchids or a score of 12 or more from the species listed in column 3 in Table 30.

Application

This guideline should be applied to naturally colonised disused PFA settlement lagoons and tips.

Rationale

⁴³ Department of the Environment. (1994). The Reclamation and Management of metalliferous mining sites. Department of the Environment Minerals Division, HMSO London.

As soon as high levels of boron and elements in the upper surfaces have decreased, PFA settlement lagoons can support unique grassland communities that are frequently species-rich. A particular feature of such sites is the presence of dense stands of various orchid species. If two or more species of *Dactylorhiza* orchid are present they often readily hybridise to form hybrid swarms.

Table 30 Vascular plants characteristic of post-industrial wastes

<u>Scientific name</u>	<u>Common name</u>	Ar1	Ar2	Ar3
<i>Agrostis capillaris</i>	common bent		*	
<i>Aira caryophylla</i>	silver hair-grass		*	
<i>Anacamptis pyramidalis</i>	pyramidal orchid			*
<i>Anagallis arvensis</i>	scarlet pimpernel	*		
<i>Anthyllis vulneraria</i>	kidney vetch			*
<i>Arenaria serpyllifolia</i>	thyme-leaved sandwort		*	
<i>Armeria maritima</i>	thrift	*		
<i>Artemisia absinthium</i>	wormwood		*	
<i>Bacidia saxenii</i>	a lichen	*		
<i>Bacidia viridescens</i>	a lichen	*		
<i>Blackstonia perfoliata</i>	yellow wort			*
<i>Botrychium lunaria</i>	moonwort	*		
<i>Bryum argenteum</i>	a moss		*	
<i>Catapodium rigidum</i>	fern grass		*	
<i>Centaurea nigra</i>	common knapweed			*
<i>Centaureum erythraea</i>	common centaury			*
<i>Cladonia cariosa</i>	a lichen		*	
<i>Cochlearia pyrenaica</i>	alpine scurvygrass	*		
<i>Crepis vesicaria</i>	beaked hawksbeard			*
<i>Dactylorhiza spp.</i>	orchid species	*		*
<i>Epipactis leptochila</i>	narrow-lipped helleborine	*		
<i>Epipactis youngiana</i>	Young's helleborine	*		
<i>Erigeron acer</i>	blue fleabane		*	*
<i>Festuca rubra</i>	red fescue			*
<i>Filago vulgaris</i>	common cudweed			*
<i>Fragaria vesca</i>	wild strawberry	*		
<i>Galium sternerii</i>	limestone bedstraw	*		
<i>Gymnadenia conopsea</i>	fragrant orchid	*		
<i>Hieracium spp.</i>	hawkweed species		*	*
<i>Hypericum perforatum</i>	perforate St John's wort		*	
<i>Hypochaeris radicata</i>	common cat's-ear			*
<i>Lathyrus pratensis</i>	meadow vetchling			*
<i>Leontodon hispidus</i>	rough hawkbit			*
<i>Leucanthemum vulgare</i>	ox-eye daisy			*
<i>Linaria vulgaris</i>	common toadflax		*	
<i>Linum catharticum</i>	fairy flax			*
<i>Listera ovata</i>	twayblade orchid	*		*
<i>Lotus corniculatus</i>	bird's-foot trefoil			*
<i>Minuartia verna</i>	spring sandwort	*		
<i>Ophrys apifera</i>	bee orchid			*
<i>Peltigera neckeri</i>	a lichen	*		
<i>Peltigera venosa</i>	a lichen	*		
<i>Pilosella officinarum</i>	mouse-ear hawkweed	*	*	*

Table 30 (cont.) Vascular plants characteristic of post-industrial wastes

<u>Scientific name</u>	<u>Common name</u>	Ar1	Ar2	Ar3
<i>Poa compressa</i>	flattened meadow grass		*	
<i>Polytrichum spp.</i>	mosses		*	
<i>Reseda lutea</i>	wild mignonette		*	
<i>Reseda luteola</i>	weld		*	*
<i>Rhinanthus minor</i>	yellow rattle			*
<i>Rumex acetosella</i>	sheeps sorrel		*	
<i>Sagina procumbens</i>	pearlwort		*	
<i>Saxifraga hypnoides</i>	mossy saxifrage	*		
<i>Steinia geophana</i>	a lichen	*		
<i>Stereocaulon condensatum</i>	a lichen	*		
<i>Stereocaulon dactylophyllum</i>	a lichen	*		
<i>Stereocaulon delisei</i>	a lichen	*		
<i>Stereocaulon nanodes</i>	a lichen	*		
<i>Stereocaulon pileatum</i>	a lichen	*		
<i>Thlaspi caerulescens</i>	alpine pennycress	*		
<i>Verbascum thapsus</i>	great mullein		*	
<i>Vesdaea leprosa</i>	a lichen	*		
<i>Vesdaea retigera</i>	a lichen	*		
<i>Vicia cracca</i>	tufted vetch			*
<i>Vicia sepium</i>	bush vetch			*
<i>Viola lutea</i>	mountain pansy	*		
<i>Vulpia bromoides</i>	squirrel-tail fescue		*	
<i>Vulpia myuros</i>	rat's-tail fescue		*	

Habitat Selection Guidelines

2.10 Mixed Habitat and Structural Mosaics

Throughout the countryside and in urban areas, many habitats occur as mosaics and contain structural variation in the vegetation. Sites may comprise habitats that are individually or collectively of conservation value, but do not necessarily satisfy specific habitat selection guidelines. Sites may also support excellent and or highly varied structure between different habitats or within the same habitat that provides a range of niches valuable for invertebrate groups. These sites can make an important contribution to the local biodiversity value of an area. These guidelines aim to address:

- (a) sites that may just fail to meet the thresholds set on the basis of their individual habitat components, but as a collection of habitats are important for their botanical and/or invertebrate value,
- (b) sites that support varied macro-habitats and provide more structural variation for invertebrates than individual habitats in isolation,
- (c) sites that support structurally diverse micro-habitat mosaics within various habitat types.

Semi-natural habitat mosaic sites can occur in the form of the grounds of large houses or commercial properties or more usually, on abandoned or less intensively managed agricultural or industrial land. In the latter case, the mosaic will often comprise habitats representative of different stages of broad succession of vegetation from bare ground or open water to marsh or woodland. Abandoned or unmanaged areas of quarries are often a good example of these types of circumstances, as they often support grassland and bare ground communities maintained by grazing rabbits and other herbivores, secondary scrub and woodland, and in low lying areas, marsh or open water. In addition, the former quarry face may provide habitats on cliffs and ledges for bats, plants, and nesting sites for birds.

Some species of fauna, particularly invertebrates, are dependent on different parts of vegetation mosaics and structure at different stages of their life cycles or for daily feeding or cover. Such variation for invertebrates is important to their survival. Structural heterogeneity can be considered on different scales.⁴⁴ The more complex the vegetation structure, the greater the niche diversity and, therefore, the greater the number of insects likely to be present.⁴⁵

Invertebrate ecologists are aware that if a site supports varied structural features then the site is worthy of survey for its invertebrate fauna and it is likely to support a more diverse invertebrate fauna than a site with homogeneous vegetation. For example, a rough possibly unmanaged grassland supporting tussocky grasses, bare ground, scrub and varied sward height is likely to be more diverse for invertebrates than a grassland that is non-rotationally grazed so that the sward height is constant. At a smaller scale, spiders, for example, use specific features of vegetation for web spinning, construction of egg cocoons, hunting and aerial dispersal. It is the combination of niches and structure within a localised area that is important for invertebrates, as opposed to large uniform habitat blocks. This variation can be equally or more important than the juxtaposition of different habitats within a site.

Structural complexity is generally a function of vegetation architecture, although it may also refer to substrate architecture. This would include river shingles or benthic habitats. Complex vegetation architecture may be an attribute of a dominant plant species (e.g. the densely woven structure of *Chara* beds in open water). It may also be as a result of different species growing together, for

⁴⁴ Hammond, M. (2000). The importance of habitat structure in assessing site quality for nature conservation. Unpub paper prepared for North Yorkshire SINC Panel. Section 2.10 includes quotes from this work with permission from the author.

⁴⁵ Speight, MR, Hunter MD & Watt, AD. (1999). Ecology of insects: concepts and applications. Blackwell Science Oxford.

example, where small sedges, species of spike rush, species of rush and mosses form a close mosaic in some types of fen and water margin vegetation. In most standing water habitats, the vast majority of macro-invertebrate biomass is associated with richly vegetated shallow water margins.

2.10.1 Habitat Mosaic Selection Guidelines

Any site that meets one of the following guidelines will be eligible for SINC selection.

Guideline

Mh1

Sites of 0.5ha or more in size that support a combination of two or more individual habitats that are of borderline SINC quality.

Application

This guideline should be applied to any area supporting a mosaic of semi-natural vegetation. Sites should support at least two habitat types that meet at least 80% of the relevant selection guidelines for the habitat types.

Rationale

Typically, mixed habitat sites will support different stages in vegetation succession. Often the individual habitat types that are part of the mosaic do not qualify as SINC in their own right either because they are too small, or because they do not support a sufficient number of indicator or characteristic species. In combination, however, these habitat types can support a significant diversity of habitats and species that can make a significant contribution to local biodiversity and nature conservation objectives.

Guideline

Mh2

Sites of 5ha or more in size that support a mosaic of the semi-natural habitats listed in Table 31 that collectively have a habitat diversity score of 6 or more *and* make a significant contribution to the local biodiversity value of the Natural Area in which they are situated.

Application

This guideline should be applied to any area supporting semi-natural vegetation in combination with artificial habitats such as rock faces. Reference should be made to the relevant local Biodiversity Action Plan to identify whether the site makes an important contribution to the Plan's geographical area or Natural Area.

Rationale

The combination of different habitat types in close proximity to each other and the gradation from one habitat to another often provides a much higher diversity of niches for a wealth of plants and animals than other sites that may be dominated by one particular habitat. These sites are particularly valuable for species that utilise more than one habitat type throughout the day and night for feeding, roosting and protection. The juxtaposition of some of these habitats can also be important for the survival of particular animal species which require two or more habitats at different times during their life cycle, such as amphibians and a range of invertebrates. These habitat mosaic sites are often important reservoirs of biodiversity, particularly in areas of the county where there is intensive land-use and/or a lack of sites of SINC quality for individual habitat types.

Guideline

Mh3

Sites of 5ha or more in size which support features indicating high structural diversity within habitat types as shown in Table 32 and either make a significant contribution to the local biodiversity value of the Natural Area in which they are situated or support a combination of 2 or more habitats which are of borderline SINC quality.

Application

This guideline should be applied to any area supporting a varied habitat structure. Reference should be made to the relevant local Biodiversity Action Plan to identify whether the site makes an important contribution to the Plan's geographical area or Natural Area. These sites will be identified in conjunction with an experienced invertebrate ecologist.

Rationale

Varied vegetation structure is important to invertebrates in every aspect and at every scale⁴⁶. This is often not recognised as a valuable component of the nature conservation resource. Large, complex and varied sites are likely to support a significant invertebrate fauna, and as such are valuable as vegetation and invertebrate assemblages.

Table 31 Habitat mosaics.

<u>Habitat</u>	<u>Score</u>
Unimproved neutral grassland (MG5, MG4, MG8)	4 points
Unimproved calcareous grassland	4 points
Unimproved lowland dry acid grassland	4 points
Ancient semi-natural woodland	4 points
Wet heath or bog	4 points
Rare scrub communities ⁴⁷	4 points
Dry heath	3 points
Uncommon scrub and pioneer woodland communities ⁴⁸	3 points
Tall coarse grassland and scattered scrub mosaic	2 points
Scrub communities of more than 1 species	2 points
Open water/and swamp (running or standing)	2 points
Marsh or fen (species-rich)	2 points
Heath/acid grassland mosaic	2 points
Secondary semi-natural woodland	2 points
Marsh or fen (species-poor)	1 point
Ruderal/bare ground communities	1 point
Single species dominated scrub	1 point
Inundation communities	1 point
Other habitat types covered by these guidelines	1 point

⁴⁶ Kirby, P. 1992. Habitat Management for Invertebrates: A practical handbook. Joint Nature Conservation Committee. Table 32 shows some of the features identified as important for invertebrates within this publication.

⁴⁷ To be included where they are too small or fragmented to merit SINC status as individual features i.e. upland willow scrub on calcareous substrates with *Salix phyllicifolia*, *S. myrsinifolia* or related hybrids; species-rich thorn scrub; willow scrub of exposed riverine sediments

⁴⁸ i.e. aspen stands, eared willow thickets on upland fringes, burnet rose underscrub, species-rich scrub-grassland transitions ('saum')

Table 32 Features of structural importance for invertebrates

Dead wood (wet and shady situations)	Scattered scrub
Dead wood (dry and open situations)	Grass tussocks
Old coppice stools	South facing slopes
Woodland rides	Steep slopes on banks
Pollards	Hummocky ground in old disused quarries
Sap runs on trees	Earthworks
River shingle	Coarse tussocky grassland
Loose hard substrates (e.g. rubble, brick, stone)	Varied sward heights from short open turf to bare ground or mud
Springs, seepages or pools	Tidal refuse
Temporary pools	Seasonally damp/wet areas
Ditches	Water margins (marginal mud, silt or sand)
Evidence of ruts & hoofprints (with continuity over several years)	

B. Species Selection Guidelines

Species Selection Guidelines

2.11 Vascular plants

Application (all guidelines)

Vascular plants include flowering plants (angiosperms) and ferns (pteridophytes). Assemblages of vascular plants have been used to describe and assess the quality of habitats in part A of this report. As a consequence, this section only considers the presence of rare species for site selection. The guidelines relate to naturally occurring, native species.

Guideline

VP1

Any site that supports a population of a plant listed in Schedule 8 and fully protected under of the Wildlife and Countryside Act 1981 (as amended) and/or is listed in the most recent version of the British Red Data Book.

Application

This guideline should be applied to any site with a population of these species. Where the species concerned occurs as a short term casual, the site should not normally be designated. Sites where there has been a recent, deliberate re-introduction, excluding species recovery programmes, should also not normally be included. The guideline will only be applied to those listed on Schedule 8, which are given full protection (i.e. Section 13(i) of the Act). Consequently, a species such as bluebell (*Hyacinthoides non-scripta*) is not protected as it is only afforded protection under Section 13(2).

Rationale

These species are the rarest and/or most threatened with extinction in the British Isles. Consequently, the protection, maintenance and enhancement of the populations of these species in North Yorkshire are vital for sustaining biological diversity throughout the British Isles and Western Europe.

Guideline

VP2

Any site supporting a population of a species native to North Yorkshire that is identified as being nationally scarce.⁴⁹

Application

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

Rationale

The species in the above categories are nationally scarce, occurring in more than 16 but less than 100 10km squares in Britain, and there is a national responsibility for their conservation.

⁴⁹ Stewart *et al* (1994). Scarce Plants in Britain. JNCC.

Guideline

VP3**Any site that supports a population of a county rare species.****Application**

This guideline should be applied where sites support a population of a species identified as a county rare plant species using the method proposed by Perring and Farrell (1996).⁵⁰ This should (when the information becomes available) be applied at the vice-county level and will exclude populations which are the result of recent deliberate introductions (which do not form part of a species recovery programme) or localities where a species occurs as a short-term casual. A species that is considered rare in one vice-county, but is common in another in North Yorkshire, will only be eligible for designation within the vice-county in which it is considered rare.

Rationale

These plant species are the rarest and/or most threatened species in North Yorkshire (excluding the national parks) and their protection, maintenance and enhancement are vital to sustaining biological diversity throughout the county.

Guideline

VP4**Any site regularly supporting a population of a vascular plant in North Yorkshire, which is at risk of becoming rare because of a recent decline in its distribution or population.****Application**

Sites supporting species that are threatened or considered vulnerable in the county should be included under this guideline. Only sites making a significant contribution to the distribution or population of the species should be selected. This guideline should only be applied where there is sufficient local, regional or national data to determine the threat to the species.

Rationale

A variety of factors can cause a sudden or gradual decline in the population of a species. These species are at risk of becoming endangered or even extinct in the County, and measures to prevent this occurring are required.

⁵⁰ Perring, F.H. and Farrell, L. (1996). Guidelines for the preparation of county rare plant registers. *BSBI News* 71

Species Selection Guidelines

2.12 Non-vascular plants

Application (all guidelines)

Non-vascular plants include lichens, bryophytes (mosses and liverworts) and algae. Information on the distribution of these species is not as well recorded as vascular plants. In general, assemblages of these species have not been used to assess habitat quality (with the exception of lichens on lead mine waste). Consequently, these guidelines are based on the presence of rare species and, where appropriate species assemblages.

Non-vascular plants require specialist survey skills and the presence of rare species should not be confirmed unless the record has been provided by a suitably qualified person.

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

Non-vascular plants will colonise a range of natural and man-made substrates. Houses, agricultural and industrial buildings, whether in use or not, and streets will not be eligible for selection.

(i) Lichens

Guideline

L1

Any site that supports a population of a lichen species listed on Schedule 8 and fully protected under the Wildlife and Countryside Act 1981 (as amended) and/or is listed in the most recent version of the British Red Data Book.

Application

All sites for lichens in the above categories should be included. Only species afforded full protection under Section 13 (i) should be included.

Rationale

Species listed in the British Red Data Books are the rarest and most vulnerable species in the British Isles, many of which are threatened with local or national extinction. The protection, maintenance and enhancement of these sites are vital for the maintenance of biological diversity throughout the British Isles and Western Europe.

Guideline

L2

Any site that supports a population of a nationally scarce lichen species.

Application

All sites for lichens in the above categories should be included.

Rationale

The species in the above categories are nationally scarce, occurring in more than 16, but less than 100 10km squares in Britain, and there is a national responsibility for their conservation.

Guideline

L3

Any site that supports a population of a lichen species rare in North Yorkshire.

Application

This guideline should be applied where sites support a population of a species identified as a county rare plant species. There is a deficiency in data across North Yorkshire either in terms of survey coverage or recent survey information. There are good historical records for parts of North Yorkshire, but many of the species recorded have become locally extinct due to aerial pollution (*pers. comm.* Professor Seaward). Owing to improving air quality some of these species are or may in future re-colonise the County. As a consequence, county rare species should be identified through consultation with experts and local recorders.

Rationale

These lichen species are the rarest and/or most threatened species in North Yorkshire (excluding the National Parks & the City of York) and their protection, maintenance and enhancement are vital to sustaining biological diversity in the county.

Guideline

L4

Any site with a New Index of Ecological Continuity score of 11 or more.

Application

This index should only be used in selecting ancient woodland and parkland sites. The index should be calculated using the methodology outlined in Hodgetts (1992)⁵¹.

Rationale

Lichens can be reliable measures of ecological continuity in woodland and parkland sites and the Index of Ecological Continuity has been developed to assess assemblages of lichens associated with ancient sites. These assemblages can only develop over a long period of time in sites that have suffered little disturbance and have a long history of woodland cover. As such they represent some of the most natural lichen communities remaining in Britain.

Guideline

L5

Any site that regularly supports a population of a lichen in North Yorkshire, which is at risk of becoming rare because of a recent decline in its distribution or population.

Application

Sites supporting species that are threatened or considered vulnerable in the county should be included under this guideline. Only sites making a significant contribution to the distribution or population of the species should be selected. This guideline should only be applied where there is sufficient local, regional or national data to determine the threat to the species.

⁵¹ Hodgetts N.G. (1992). Guidelines for the selection of Sites of Special Scientific Interest: non-vascular plants. JNCC

Rationale

A variety of factors can cause a sudden or gradual decline in the population of a species. These species are at risk of becoming endangered or even extinct in the County and measures to prevent this occurring are required.

(ii) Mosses and Liverworts (Bryophytes)

Guideline

ML1

Any site that supports a population of a moss or liverwort species listed in Schedule 8 and fully protected under the Wildlife and Countryside Act 1981 (as amended) and/or is listed in the most recent version of the British Red Data Book.

Application

All sites for mosses and liverworts in the above categories should be included. Species not provided protection under Section 13(i) of the Act should not be included.

Rationale

These species are rare and/or threatened with extinction in Britain. Consequently, there is an obligation to maintain and enhance these sites in order to sustain biological diversity throughout the British Isles and Western Europe.

Guideline

ML2

Any site that supports a population of a nationally scarce moss or liverwort species.

Application

This guideline should be applied to all sites supporting nationally scarce mosses and liverworts (Hodgetts, 1992)⁵²

Rationale

These species have been recorded from between 16 and 100 10km grid squares in Britain. They are, therefore, scarce nationally and merit protection throughout their range.

Guideline

ML3

Any site that supports a population of a moss or liverwort that is rare in North Yorkshire.

Application

This guideline should be applied where sites support a population of a species identified as a county rare plant species using the method proposed by Perring and Farrell (1996). This should (when the information becomes available) be applied at the vice-county level and will exclude populations which are the result of recent deliberate introductions (which do not form part of a species recovery programme) or localities where a species occurs as a short-term casual. Species considered rare

⁵² Hodgetts N.G. (1992). Guidelines for the selection of sites of special scientific interest: non-vascular plants. JNCC

in one vice-county, but common in another in North Yorkshire, will only be eligible for designation within the vice-county in which it is considered rare.

Rationale

These bryophyte species are the rarest and/or most threatened species in North Yorkshire (excluding the National Parks & the City of York) and their protection, maintenance and enhancement are vital to sustaining biological diversity in the county.

Guideline

ML4

Any site that regularly supports a population of a moss or liverwort in North Yorkshire, which is at risk of becoming rare because of a recent decline in its distribution or population.

Application

Sites supporting species that are threatened or considered vulnerable in the county should be included under this guideline. Only sites making a significant contribution to the distribution or population of the species should be selected. This guideline should only be applied where there is sufficient local, regional or national data to determine the threat to the species.

Rationale

A variety of factors can cause a sudden or gradual decline in the population of a species. These species are at risk of becoming endangered or even extinct in the County, and measures to prevent this occurring are required.

(iii) Stoneworts (Algae)

Guideline

S1

Any site that supports a population of a species or taxa that is nationally rare or scarce or is considered to be rare in North Yorkshire.

Application

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

Rationale

These species are the rarest and/or most threatened with extinction in the British Isles. Consequently, the protection, maintenance and enhancement of the populations of these species in North Yorkshire are vital for sustaining biological diversity throughout the British Isles and Western Europe.

Species Selection Guidelines

2.13 Fungi

Guideline

Fu1

Any site that supports a population of a fungus listed in Schedule 8 and fully protected under the Wildlife and Countryside Act 1981 (as amended) and/or is in the most recent relevant British Red Data Book.

Application

This guideline should be applied to any site with a population of these species. Where the species concerned occurs as a short term casual, the site should not normally be designated. Sites where there has been a recent, deliberate re-introduction, excluding species recovery programmes, should also not normally be included. Species not afforded protection under Section 13(i) of the Act should be excluded from this guideline.

Rationale

These species are the rarest and/or most threatened with extinction in the British Isles. Consequently, the protection, maintenance and enhancement of the populations of these species in North Yorkshire are vital for sustaining biological diversity throughout the British Isles and Western Europe.

Guideline

Fu2

Any site that supports a population of a nationally scarce fungus.

Application

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

Rationale

The species in the above categories are nationally scarce, occurring in more than 16 but less than 100 10km squares in Britain, and there is a national responsibility for their conservation.

Guideline

Fu3

Any site that supports a population of a fungus considered rare in North Yorkshire.

Application

This guideline should be applied where sites support a population of a species identified as a county rare plant species. Fungi of cultivated plants and crops should not normally be included.

Rationale

These plant species are the rarest and/or most threatened species in North Yorkshire (excluding the National Parks & the City of York) and their protection, maintenance and enhancement are vital to sustaining biological diversity in the county.

Species Selection Guidelines

2.14 Mammals

Application (all mammal guidelines)

The evidence of the presence of a mammal species will be based on field signs and sightings. Field signs include breeding sites and faecal material.

(i) Bats

Guideline

M1(a)

Any hibernation site that regularly supports 2 or more species of bat and 30 or more individuals.

Guideline

M1(b)

Any site that regularly supports roosts of 3 or more species of bat.

Guideline

M1(c)

Any breeding roost site that regularly supports a significant population of a bat species (see Table 33).

Application (all bat selection guidelines)

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

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

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

Rationale (all bat selection guidelines)

All species of British bat are protected under section 9 of the Wildlife and Countryside Act 1981 (as amended) and section 39 of The Conservation (Natural Habitats, &c.) Regulations. This protection is provided because all species of bat have declined significantly throughout the UK in the last 50 years. This decline has been brought about by a variety of factors, including reduction in habitat

and subsequent habitat fragmentation, destruction of roost sites, either directly or through chemical treatment of roof timbers, and a reduction in insect food supplies arising from reduced habitat and extensive use of pesticides.

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

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

Table 33 Numbers of bats that indicate a significant breeding roost in North Yorkshire

Bat species	Significant roost
Pipistrellus pipistrellus	100 or more animals
Pipistrellus pygmaeus	100 or more animals
Plecotus auritus	50 or more
Nyctalus noctula	50 or more
Myotis daubentoni	50 or more
Myotis nattereri	50 or more
Myotis mystacinus	50 or more
Myotis brandti	50 or more

(ii) All other mammals

Guideline

M2

Any site that regularly supports a population of a native mammal species listed in Annex 2 of the Habitats Directive and protected by section 9(1) of the Wildlife and Countryside Act 1981 (as amended).

Application

Any site supporting a population of a species that qualifies under this guideline should be considered for designation. Recently introduced species should be excluded unless they are part of a recognised recovery programme.

Rationale

These species are provided protection under UK legislation because they are restricted in distribution or have suffered dramatic declines in recent years in the UK and/or Europe. Consequently, there is a national or international obligation to ensure their conservation.

Guideline

M3

Any site regularly supporting a population of a native mammal species, which is recorded from 3 or less sites in North Yorkshire.

Application

Any site supporting a population of a species, which qualifies under this guideline, should be considered for designation. Recently introduced species should be excluded unless they are part of a recognised recovery programme.

Rationale

These mammal species are rare in North Yorkshire.

Guideline

M4

Any site that regularly supports a population of a native mammal species which is recorded from 3 or more sites in North Yorkshire, but is considered to be under threat because of small and/or isolated populations, significant decline or habitat loss or degradation.

Application

Any site supporting a population of a species, which qualifies under this guideline, should be considered for designation. Recently introduced species should be excluded unless they are part of a recognised recovery programme.

Rationale

A number of mammal species have suffered extensive declines in recent years over much of the UK (e.g. Water Vole) and proactive action is required to try and halt the decline. Other species occur in small, often isolated populations that are also vulnerable and require protection to ensure they are not unduly affected.

Species Selection Guidelines

2.15 Birds

Application (all bird guidelines)

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

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

For the purposes of these guidelines, 'regularly' will be judged by the species being recorded in at least 4 of the most recent 5 years for which data are available.

Guideline

B1

Any grassland, heathland or wetland site regularly supporting three or more species of breeding wader.

Application

This guideline does not apply to arable farmland (where Lapwing, Oystercatcher and occasionally Curlew may nest) because suitability changes from year to year depending on cropping practices. It does not apply to operational quarries, where successional conditions and levels of disturbance influence the presence of ground-nesting birds; however, it may be applied to mineral sites which have undergone restoration.

In the uplands and upland fringes (including wet grassland and heath at intermediate elevations), boundaries should comprise a well-defined area of enclosed grasslands and/or a named Moor or Common within the boundaries of a single Parish.

Rationale

North Yorkshire supports important populations of breeding wading birds including Oystercatcher, Avocet, Little Ringed Plover, Ringed Plover, Golden Plover, Lapwing, Dunlin, Snipe, Woodcock, Curlew, Common Sandpiper and Redshank. Both the North York Moors and North Pennine Moors Special Protection Areas (SPAs) are of European importance for breeding Golden Plover and of national importance for Curlew. The North Pennine Moors are also of European importance for breeding Dunlin of the *schinzii* subspecies. Wading bird populations in these large upland SPAs extend into neighbouring areas, especially around the eastern edge of the Yorkshire Dales, with high densities in some locations.

Most breeding waders are in decline and North Yorkshire is of particular importance for some species. For example, the UK supports 19-27% of the global Curlew population with the County representing a stronghold within the UK. Curlew is a species of global conservation concern, but its English breeding population declined by 30% between 1995 and 2012. The current inventory of Birds of Conservation Concern in the UK (BoCC 4) affords Red List status to Lapwing, Ringed Plover, Curlew and Woodcock with Avocet, Oystercatcher, Dunlin, Common Sandpiper, Redshank and Snipe being Amber listed.

Breeding waders have declined severely in the lowlands: between 1982 and 2002 there were declines of 38% for Lapwing, 61% for Snipe, 40% for Curlew and 29% for Redshank⁵³. Species other than Lapwing and Oystercatcher have become increasingly concentrated in large wetland nature reserves⁵⁴. Nesting waders are now scarce in former strongholds in North Yorkshire such as the Vale of Pickering carrs and the floodplain meadows along the River Ouse.

Guideline

B2

Any site which regularly supports 0.04% of the British non-breeding population (or the relevant international population) of any waterbird covered by the Wetland Bird Survey (WeBS).

Application

This guideline applies to non-breeding populations on inland and coastal sites above the mean high water mark. It does not apply to buildings or landfill sites but can be applied to coastal structures such as breakwaters.

Numbers should be based on average (mean) peak counts outside the breeding season; wherever possible, at least five years' data should be used. Exceptional numbers of birds using a site only fleetingly (e.g. large goose flocks landing briefly) should not be used except as part of a long data series. A minimum threshold of 5 birds should normally be applied.

Feral populations should not be included, nor should captive-bred birds released for shooting. Mallard should be excluded for this reason, as many are released in the county.

The 1% population thresholds are published and updated regularly on the Wetland Bird Survey website (<https://www.bto.org/volunteer-surveys/webs/data/species-threshold-levels>). The 0.04% figure should be rounded to the nearest bird.

Rationale

A wetland is considered nationally important if it regularly holds 1% or more of the estimated British population of a species or subspecies of waterbird. This threshold is used in the selection of Sites of Special Scientific Interest. North Yorkshire covers 4.13% of the land area of Great Britain. Therefore any site supporting 0.04% of the British population can be considered significant in proportion to the area of the County.

International significance relates to the relevant biogeographical population. In a few instances, the threshold for international significance is lower than that for national importance. In these cases the lower figure can be used.

This guideline would be difficult to apply for other birds since many species have very large national populations; in addition, they are more difficult to census and population estimates include a wide margin of error.

⁵³ A.M. Wilson et al (2005). Changes in the numbers of breeding waders on lowland wet grasslands in England and Wales between 1982 and 2002. *Bird Study*, **52**: 55-69.

⁵⁴ A Wilson, C Pendelbury & J Vickery (2005). *Changes in lowland wet grassland breeding wader numbers: the influence of site designation*. BTO Research Report 365. British Trust for Ornithology: Thetford.

Guideline

B3

Any site which has held one or more breeding pairs of Rare Breeding Birds panel species during at least two of the previous three years.

Application

This guideline should be applied with discretion to sites where there is a reasonable evidence of a regular breeding population. It should not be applied to sporadic breeding attempts at the edge of a species' range or where successional changes are likely to impair a species' ability to breed in the near future. It does not apply to buildings.

The RBBP lists are revised periodically, so sites designated under this guideline will need to be kept under review. All sites should be reviewed at 5 year intervals.

In addition to the species listed above, other rare breeding birds are likely to become established in North Yorkshire in future (e.g. Cetti's Warbler, Little Egret).

Rationale

This guideline is intended to protect sites for nationally rare breeding birds in North Yorkshire. These are species monitored by the Rare Breeding Birds Panel <http://www.rbbp.org.uk/>.

Relevant species include: Pintail, Eurasian Wigeon, Garganey, Common Pochard, Common Quail, Eurasian Bittern, Black-necked Grebe, Honey Buzzard, Hen Harrier, Northern Goshawk, Water Rail, Spotted Crake, Corn Crake, Avocet, Little Ringed Plover, Mediterranean Gull, Long-eared Owl, Short-eared Owl, Lesser Spotted Woodpecker, Merlin, Hobby, Peregrine Falcon, Black Redstart, Willow Tit and Hawfinch.

Guideline

B4

Any site holding a cliff-nesting colony of auks or kittiwakes.

Application

This guideline applies to auks (Guillemot, Razorbill, Puffin) or Kittiwakes nesting on natural cliffs or rock outcrops. Buildings and other man-made structures are excluded. It does not apply to Fulmars, Cormorants or gulls other than Kittiwake.

Rationale

The UK holds internationally important seabird populations with almost all the major colonies being designated as SSSIs. Those on the Yorkshire coast at Flamborough Head and Bempton Cliffs Special Protection Area support an internationally important breeding population of Kittiwakes (the largest in the UK) and are of European importance for the number of seabirds. England's largest breeding Guillemot population is spread over the cliffs from Flamborough Head northwards to Lebberston Cliff. Although a proposed extension of the SPA will incorporate all the currently-known auk habitat, these birds could potentially expand in future. There are colonies of Kittiwake outside the SPA, most notably at Scarborough Castle headland.

Guideline

B5**Any site supporting a breeding, wintering or passage population of any bird of conservation concern which is of district, County or regional importance****Application**

This guideline applies only to Red or Amber List species in the current version of *Birds of Conservation Concern*⁵⁵. The population must be relevant to the qualifying criteria for the species, e.g. it would not apply to wintering populations of Redwing and Fieldfare since these are Red Listed only for their small and declining breeding populations.

It does not cover gardens, buildings, bridges, working quarries or arable land.

Sites with high breeding productivity can be considered because these may be key to the recovery of declining birds in the wider countryside, but this should be based on reliable data series covering at least 3 years.

Any decision to designate a site using this guideline should be supported by expert judgement.

Rationale

This guideline is intended to cover sites which are of exceptional importance for birds of conservation concern in at least a district-wide context. This could include:

- sites supporting exceptional breeding densities of widespread but seriously declining birds such as Lapwing or Skylark;
- sites supporting breeding populations with high productivity
- sites believed to support one of the largest populations in the relevant National Character Area
- sites which provide regular roosting habitat for significant numbers

⁵⁵ Currently: M. Eaton, N. Aebischer, A. Brown, R. Hearn, L. Lock, A. Musgrove, D. Noble, D. Stroud & R. Gregory (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, **108**: 708-746.

Species Selection Guidelines

2.16 Reptiles and amphibians

(i) Reptiles

Application (all reptile guidelines)

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

Guideline

R1

Any site that regularly supports a population of a reptile species recorded from 3 or less sites in North Yorkshire.

Rationale

These species of reptile are rare in North Yorkshire.

Guideline

R2

Any site that regularly supports a population of two or more reptile species.

Rationale

There are four species of reptile recorded from North Yorkshire:

Grass snake (*Natrix natrix*)

Adder (*Vipus berus*)

Common lizard (*Lacerta vivipara*)

Slow worm (*Anguis fragilis*)

The presence of two or more reptiles is, therefore, considered to represent a good reptile site.

(ii) Amphibians

Application (all amphibian guidelines)

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

The designation of sites should attempt to include both aquatic and terrestrial habitats of importance. Consequently, breeding sites should be included together with adjacent habitat known

⁵⁶ English Nature (2001). *Great crested newt mitigation guidelines*. English Nature

or likely to be used by the amphibian species for which the site is designated. Hibernating sites should be included wherever possible.

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

Guideline

A1a

Any site that regularly supports four or more species of amphibian native to North Yorkshire.

Rationale

Six species of native amphibian are recorded from the UK. All of which have declined in the UK over the last 50 years as a result primarily of habitat loss. Five amphibian species have been recorded from North Yorkshire, (see Table 26). Consequently, the presence of four species is considered to be a valuable assemblage of amphibians.

Guideline

A1b

Any site which scores 5 or more for its breeding amphibian species assemblage.

Application

To determine the amphibian assemblage score reference should be made to Table 35, which has been taken from JNCC 1998⁵⁷. The scores have to be for breeding sites surveyed during the breeding season following the guidelines set out in English Nature (2001).

Rationale

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

⁵⁷ JNCC (1998) *Guidelines for selection of biological SSSIs*. HMSO

Table 35. Assessment of amphibian populations

Species	Method	Low/Small	Good/Medium	Exceptional/Large
		Population	Population	Population
		Score 1 point	Score 2 points	Score 3 points
Great Crested Newt	Seen or netted in day	<5	5-50	>50
	Counted at night	<10	11-100	>100
Smooth newt	Netted in day	<10	10-100	>100
	Counted at night			
Palmate newt	Netted in day	<10	10-100	>100
	Counted at night			
Common toad	Estimated	<500	500 – 5,000	>5,000
	Counted	<100	100 – 1,000	
Common frog	Spawn clumps counted	<50	50-500	>500

Guideline

A2**Any site supporting a good population of Great Crested Newt (*Triturus cristatus*)****Application**

A good population will be determined by reference to Table 35.

Rationale

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

Guideline

A3**Any site supporting an exceptional population of an amphibian species.****Application**

An exceptional population will be determined by reference to Table 35.

Rationale

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

Species Selection Guidelines

2.17 Fish

Guideline

F1

Any watercourse regularly supporting a native population of a species of fish listed in Annex 2 of the EC Habitats Directive that are recorded from 5 or less sites in North Yorkshire.

Application

This guideline should be applied to all watercourses that regularly support these species. The boundaries of the designated area should include those sections of the river important for the development of fry, migration and spawning.

Rationale

These species are noted as of importance in the European context in the Conservation (Natural Habitats etc.) Regulations. Consequently, populations of these species should be protected especially where they are sparsely located.

Guideline

F2

Any watercourse regularly supporting a native population of a species of fish listed in Annex 2 of the EC Habitats Directive recorded from more than 5 sites in North Yorkshire, where the site makes a significant contribution to the distribution of the species or the total population size in the county.

Application

This guideline should be applied only to watercourses that regularly support these species. The boundaries of the designated area should include these sections of the river important for the development of fry, migration and spawning.

Rationale

These species are noted as of importance in the European context in the Conservation (Natural Habitats etc.) Regulations. Consequently, whilst some of these species are currently relatively widespread, populations should be protected where they add significantly to the distribution of the species in any given locality and where there are strong populations.

Species Selection Guidelines

2.18 Invertebrates

Application (all invertebrate guidelines)

For the determination of site boundaries, account should be taken of the life cycles of the species for which a designation is made. Many species require very different habitats for their larval and adult stages and it is important for survival that there continues to be available the full range of different habitats from one year to the next.

Nationally scarce species are usually sub-divided into nationally scarce A and nationally scarce B species. For the purposes of these guidelines, this sub-division is not used and species are recognised as just being nationally scarce. However, as invertebrates cover such a wide range of groups, the extent of knowledge and survey cover of some species and groups of species are not as detailed as other biotic groups such as vascular plants. Consequently, those guidelines that rely on the presence of a single nationally scarce species, will normally only be applied to species groups that have been relatively well surveyed either nationally or within North Yorkshire. For the

same reason, for many groups of invertebrates there is insufficient information about distribution in North Yorkshire for specific guidelines to be developed at this time.

(i) *Butterflies and Moths (Lepidoptera)*

Application (all butterfly and moth guidelines)

Breeding status can be determined either by the presence of eggs, larvae or pupae or by repeated sightings of adults utilising suitable habitats and/or food plants.

Guideline

BM1

Any site regularly supporting a breeding population of a nationally rare or nationally scarce species of Lepidoptera.

Application

This guideline will be applied only to those species listed in the British Red Data Books.

Rationale

Butterflies and macro-moths are well recorded, compared to other less conspicuous groups of invertebrates. These particular species are rare, scarce and threatened within Britain, and merit protection.

Guideline

BM2

Any site regularly supporting a breeding population of a species of Lepidoptera recorded from 3 or less sites in North Yorkshire.

Rationale

Although not nationally rare or scarce, these species are considered to be rare and potentially threatened in North Yorkshire and merit protection in order to maintain the biodiversity of the county.

(ii) *Damselflies and dragonflies (Odonata)*

Application (all Dragonfly and Damselfly guidelines)

Breeding status can be determined either by observing females ovipositing, or the identification of larvae or exuvia. The presence of eggs, larvae or pupae or by repeated sightings of adults utilising suitable habitats and/or food plants. A number of species of *Odonata* are known to be extending their range in Britain, and as such, the thresholds stated below will be regularly reviewed to reflect the changing situation in North Yorkshire.

Guideline

DD1

Any site which regularly supports a breeding population of a nationally rare or nationally scarce species of Odonata.

Application

This guideline will be applied only to those species listed in the most recent version of the British Red Data Books and those listed as nationally scarce.

Rationale

Dragonflies and damselflies are well recorded compared to other less conspicuous groups of invertebrates. The species subject to this guideline are rare, scarce and threatened within Britain and merit protection.

Guideline

DD2

Any site regularly supporting a breeding population of a species of Odonata recorded from 3 or less sites in North Yorkshire.

Rationale

Although not nationally rare or scarce, these species are considered to be rare and potentially threatened in North Yorkshire and merit protection in order to maintain the biodiversity of the county.

Guideline

DD3

Any site regularly supporting an assemblage of breeding populations of 8 or more species of Odonata.

Rationale

There are 20 breeding species of Odonata recorded from North Yorkshire; however, some are restricted to particular areas of the county. For example, beautiful demoiselle is restricted to the North York Moors, black-tailed skimmer is thought to be locally restricted to the north of the county and keeled skimmer is rare and occurs on moorland bogs. Any site, therefore, which supports 8 or more breeding species represents approximately 50% of those species which have widespread distribution in North Yorkshire, and is considered to be an important assemblage.

(iii) Wasps, Ants and Bees (Hymenoptera: Aculeata)**Application (all Hymenoptera: Aculeata guidelines)**

Breeding status can be determined either by observing females laying eggs or carrying food supplies to cells and burrows, the presence of nests, eggs, larvae or pupae or by repeated sightings of adults utilising suitable habitats and/or food plants.

Rationale (all Hymenoptera: Aculeata guidelines)

At the national level approximately 50% of Aculeate species are under threat (Archer 1998) which is one of the highest percentages of threat of any invertebrate group in Britain. The decline of this group and the continuing threat is due to a variety of factors including: the complex habitat requirements, low reproductive rates, loss of habitat and limited powers of dispersal.

Guideline

H1

Any site supporting a breeding population of any nationally rare or scarce species listed in the most recent version of Red Data Books of aculeate Hymenoptera or a species protected under the Habitats Directive and/or listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

Application

This guideline will be applied to those species occurring on the most recent lists of species available, either published or unpublished.

Guideline

H2

Any site supporting a breeding population of native species of aculeate Hymenoptera considered rare in North Yorkshire.

Application

County rare species are those that are recorded from 3 or less sites in the county outside the National Parks and the administrative boundaries of the City of York.

Guideline

H3

Any site supporting a breeding population of native species of Aculeate Hymenoptera considered to be threatened in Watsonian Yorkshire⁵⁸.

Application

Threatened species should be determined using the definition developed by Archer (1998), which defines levels of rarity within the wider context of Watsonian Yorkshire.

Rationale

As well as the threat to these species nationally, there is good survey data for these species from the Watsonian Yorkshire area, which enables an assessment to be made of the importance of sites in a wider context than North Yorkshire.

⁵⁸ Archer, M. (1998). Threatened Wasps, Ants and Bees (Hymenoptera: Aculeata) in Watsonian Yorkshire. A Red Data Book. PLACE Research Centre, Occasional Paper No. 2.

Guideline

H4**Any site supporting a good breeding assemblage of native species of ant (Formicidae) in Watsonian Yorkshire.****Application**

A good population will be determined by the presence of 5 or more species of ant, which represents 30% of the ant fauna of Watsonian Yorkshire recorded since 1970.

(iv) Other invertebrates

Guideline

I1**Any site supporting a population of any nationally rare species or a species protected under the Habitats Directive and/or listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).****Application**

This guideline should be applied to any site from which species listed in the most up date publications on national rarity are recorded. Site designation should normally only be made if there is evidence of breeding and/or if there is suitable habitat to support a population.

Rationale

These species are rare and/or threatened at a national or European level and there is an obligation to protect and enhance populations of these species in North Yorkshire, to ensure the maintenance of biodiversity throughout Britain and Western Europe.

Guideline

I2**Any site supporting a population of native species considered rare in North Yorkshire.****Application**

County rare species are those that are recorded from 3 or less sites in the county outside the National Parks and the administrative boundaries of the City of York.

Rationale

These species are rare in North Yorkshire and merit protection.

Glossary

Ancient Woodland - There can be some confusion about the terms used to describe woodland types. Relics of primeval woodland which have continuously occupied the same site since the original wildwood covered the British Isles at the end of the last ice age are referred to as primary woodland. Although these woodlands may have been managed for centuries they have never been clear-felled or replanted and support trees and shrubs native to the sites. Secondary woodlands are those that have formed on land which was cleared of trees at one time, although this may have occurred many hundreds of years ago. On the basis of its age woodland may be classified as ancient or recent. All ancient woodlands date back to medieval times or earlier (pre 1600 A.D in England). In general, recent woodlands are post medieval and although new woodland planting became increasingly common place during the 18th century the majority of woodland that existed in 1800 is believed to have been primary woodland.

All primary woodlands are ancient, whereas secondary woodlands may be ancient or recent. Ancient woodlands generally have richer, more characteristic floras, greater vegetation structure and age class diversity and in general a high nature conservation interest. It is now widely recognised that ancient woodlands support a suite of species that are confined to older sites.

Blanket Bog – These ombrotrophic mires are typical of the regions to the north and west of the British Isles where rainfall is very high (>1500mm/annum) and/or evaporation is low. They have developed in shallow depressions and on flat, gently sloping ground, often covering most of the landscape.

Brackish – Partially saline waters often found mid-way between freshwater and saline water.

Eutrophic – Mineral-rich waters, usually with high levels of soluble nitrogen and phosphorous. Eutrophic water bodies support a high primary productivity. In shallow eutrophic lakes, mineral sediments are rapidly colonised by macrophytic vegetation, the growth of which may be luxuriant.

Fen – A wetland type often following swamp in the hydrosere succession. Fens have a summer water table at or below the sediment surface but being flooded in winter. Can be divided into poor and rich fens, based both on the chemical composition of the fen waters and the species diversity of the vegetation.

Hydrosere – A continuum of vegetation types, which replace each other as succession proceeds from open water to forested mire or dry woodland.

LNR – Local Nature Reserve.

Marsh – The wet mineral-ground margin of freshwater swamp or fen. Usually non-peat forming systems only subject to periodic waterlogging during the winter months.

Mesotrophic – The terms oligotrophic and eutrophic are used to describe opposite ends of the spectrum of primary productivity in water bodies. Lakes and rivers may however have a trophic system between these two extremes, a range of variation, which is encompassed by the term mesotrophic.

Mire – Any stage of the hydrosere where there is a high water table, suppression of organic matter decomposition or undecomposed organic material accumulates.

Moorland – Is a broad term for land above the moor wall (usually 250-300 metre). Moorland supports a wide range of habitats, but is primarily comprised of blanket bog, dry upland heath and acid grassland.

Niche – Is the sum of the characters that determines the position of a species in an ecosystem including all the factors necessary for the survival of the species.

NVC - National Vegetation Classification. The NVC is a standard description of the types of vegetation of Britain that form under particular environmental conditions and in different geographical locations.

Nitrophile – Nitrogen loving species.

NNR – National Nature Reserve

Oligotrophic – In Great Britain, oligotrophic waters are mainly found in upland areas where high rainfall and hard, nutrient-poor rocks provide a supply of mineral-poor waters. Oligotrophic waters support low primary productivity due to low levels, in particular, of Nitrogen and Phosphorous, and are usually very clear.

Ombrotrophic – A supply of nutrients to a wetland system entirely from precipitation (i.e. rainwater, snow and atmospheric fall).

Peat – The partially decomposed or undecomposed organic remains of plants and animals. Peat forms when the decomposition or physical removal of organic material fails to keep pace with its rate of addition. This normally occurs because decomposition is inhibited as a result of a high water table.

Podsol - This is a type of soil that forms over hard rocks of north and west Britain where there is strong leaching of minerals and nutrients from the upper layers of the soil profile and subsequent deposition deeper in the profile. Podsoles can also occur on nutrient-poor coarse sand and gravels. They are nutrient-poor and have an acid reaction.

Primary production – The production by living organisms of organic material from inorganic resources.

Raised Bog (Mire) – These rain-fed peatlands are characteristically dome shaped and the central cupola of peat may be several metres above the mineral ground mire basin. The cupola is more convex in areas of high effective precipitation. Raised mires (unlike blanket mires) are usually limited in extent and definable for most of their perimeter by an easily recognisable boundary stream/swamp, which marks the transition between the raised bog peat and mineral soils.

Ramsar Site - These are internationally important sites for wetlands that have been identified as part of the requirements of the Ramsar Convention.

RSPB – The Royal Society for the Protection of Birds

SAC – Special Area for Conservation. These are internationally important sites for habitats and animals other than birds that have been identified as part of the requirements of the EU Habitats Directive. They are part of the series of sites across the European Union known as Natura 2000.

Semi-natural woodland – The term semi-natural woodland refers to woodland comprised of species native to the locality that have not obviously been planted. Ancient and semi-natural woodland is not necessarily the same thing. Ancient refers to the site as woodland over time, whereas semi-natural refers to what is growing on the site.

SINC – Site of Importance for Nature Conservation

SPA – Special Protection Area. These are internationally important sites for birds that have been identified as part of the requirements of the EU Bird Directive. They are part of the series of sites across the European Union known as Natura 2000.

SSSI – Site of Special Scientific Interest.

Swamp - A freshwater wetland habitat characteristic of lake margins in which both organic and inorganic materials contribute to sediment accumulation. The water table is permanently above the sediment surface and the vegetation is usually dominated by herbaceous monocotyledons. Species diversity is often low with plant communities often dominated by 1 or 2 species.

Taxa - A grouping of organisms given a formal taxonomic name such as species, genus, family, etc.

Veteran Tree – These trees are not capable of a precise definition owing to the different characteristics of species. However, veteran trees are trees of interest biologically, aesthetically and culturally because of their age. They are trees in the ancient stage of their life and they are trees that are old relative to others of the same species.

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