

Local Sites in the East Riding of Yorkshire

Part B

LWS Site Selection Guidelines

Contents

Part B – LWS Site Selection Guidelines

Contents: Part B – LWS Site Selection Guidelines	II
1. Overview of the natural resources of the East Riding of Yorkshire	1
1.1 Basic geography of the East riding of Yorkshire	1
1.2 National Character areas	1
1.3 Holderness Natural Area	1
1.4 Yorkshire Wolds Natural Area	2
1.5 Vale of York Natural Area	4
1.6 Humberhead Levels Natural Area	5
1.7 Humber Estuary Natural Area	7
2. Development of the LWS Site Selection Guidelines	8
2.1 Designation of SINCs	8
2.2 Development of the LWS System	8
3. Guidelines for the Selection of Local Wildlife Sites – Habitat Guidelines	10
3.1 Grassland and Heathland	10
3.1.1 Background	10
3.1.2 Neutral Grassland	10
3.1.3 Acid Grassland	11
3.1.4 Calcareous Grassland	12
3.1.5 Species-rich Verges	12
3.1.6 Heathland	13
3.1.7 Selection Criteria and Attributes	13
3.1.8 General Application of all Grassland and Heathland Guidelines	14
3.1.9 Grassland and Heathland Selection Guidelines	15
3.2 Woodland, Scrub and Hedgerow	27
3.2.1 Background	27
3.2.2 Ancient Woodland	27
3.2.3 Wet Woodland	28
3.2.4 Mixed Ash Woodland of neutral and calcareous soils	29
3.2.5 Oak Woodland of neutral to acid soils	29
3.2.6 Beech Woodland of neutral to calcareous soils	29
3.2.7 Scrub	29
3.2.8 Hedgerows	29
3.2.9 Selection Criteria and Attributes	30
3.2.10 Woodland Selection Guidelines	31
3.3 Parkland, Wood Pasture and Traditional Orchards	40
3.3.1 Background	40

3.3.2	Parkland	40
3.3.3	Wood Pasture	40
3.3.4	Veteran Trees	40
3.3.5	Traditional Orchards	41
3.3.6	Selection Criteria and Attributes	41
3.3.7	Parkland, Wood Pasture and Traditional orchard selection Guidelines	42
3.4	Fens, Lowland Mires, Springs and Flushes	44
3.4.1	Background	44
3.4.2	Poor-fens and lowland acid mires	45
3.4.3	Rich-fens and calcareous springs/flushes	45
3.4.4	Selection Criteria and Attributes	46
3.4.5	Fens, Lowland Mires, Springs and Flushes Guidelines	47
3.5	Standing Water Habitats	54
3.5.1	Background	54
3.5.2	Eutrophic Standing Waters	55
3.5.3	Mesotrophic Standing waters	56
3.5.4	Selection Criteria and Attributes	57
3.5.5	General Application of the Standing Water Guidelines	58
3.5.6	Standing Water Selection Guidelines	58
3.6	Flowing Water Habitats	64
3.6.1	Background	64
3.6.2	Rivers	65
3.6.3	Land and level Drains	66
3.6.4	Selection Criteria and Attributes	66
3.6.5	General Application of the Flowing Water Guidelines	67
3.6.6	Flowing Water Selection Guidelines	68
3.7	Coastal and Estuarine Habitats	72
3.7.1	Background	72
3.7.2	Maritime Cliff and Slope	73
3.7.3	Coastal sand dunes	73
3.7.4	Saline lagoons	73
3.7.5	Coastal vegetated shingle	74
3.7.6	Saltmarsh	74
3.7.7	Mudflats and sea-grass beds	74
3.7.8	Selection Criteria and Attributes	74
3.7.9	Coastal and Estuarine Selection Guidelines	75
3.8	Mixed Habitat and Structural Mosaics	76
3.8.1	Background	76
3.8.2	Mixed Habitat and Mosaic Selection Guidelines	78
4.	Guidelines for the Selection of Local Wildlife Sites – Species Guidelines	81
4.1	Species Guidelines Background	81
4.2	Application of the Species Guidelines	81

4.3	Vascular Plants	82
4.3.1	Background	82
4.3.2	Application of the Vascular Plant Guidelines	82
4.3.3	Vascular Plant Selection Guidelines	83
4.4	Non-vascular Plants	83
4.4.1	Background	83
4.4.2	Non-vascular Plant selection Guidelines	84
4.5	Fungi	84
4.5.1	Background	84
4.5.2	Fungi Selection Guidelines	85
4.6	Mammals	86
4.6.1	Background	86
4.6.2	Mammals selection Guidelines	87
4.7	Birds	87
4.7.1	Background	87
4.7.2	Birds Selection Guidelines	88
4.8	Reptiles	93
4.8.1	Background	93
4.8.2	Reptile Selection Guideline	94
4.9	Amphibians	94
4.9.1	Background	94
4.9.2	Amphibian Selection Guidelines	95
4.10	Fish	96
4.10.1	Background	96
4.10.2	Fish Selection Guidelines	97
4.11	Invertebrates	98
4.11.1	Background	98
4.11.2	Invertebrate Selection Guidelines - General	99
4.11.3	Invertebrate Selection Guidelines – Butterflies and Moths	101
4.11.4	Invertebrate selection Guidelines – Dragonflies and Damselflies	101
4.11.5	Invertebrates Selection Guidelines – Grasshoppers and Crickets	102
5.	Community Value Guidelines	103
5.1	Background	103
5.2	Community Value Selection Guidelines	103

1. Overview of the Natural Resources of the East Riding of Yorkshire

1.1 Basic Geography of the East Riding

1.1.1 The East Riding of Yorkshire covers an area of 2,409 km². It is a predominantly low lying county with the highest point being Garrowby Hill in the Yorkshire Wolds, which is 245 m above sea level. It is bounded to the east by the North Sea and to the south by the Humber Estuary. The two longest rivers in the county are the rivers Hull and Derwent. The Derwent drains into the Humber Estuary via the lower reaches of the River Ouse. Land use is dominated by farming with arable land covering approximately 70% of the County. Consequently semi-natural habitats are rather sparse and occur in relatively isolated fragments. An example of this is woodland coverage which at 2.6% is well below the national average of 8.4%.

1.2 National Character Areas

1.2.1 Natural England is in the process of developing profiles for National Character Areas (NCA). These will incorporate elements from their previous biodiversity based Natural Areas (NA) and landscape based Joint Character Areas (JCA). They will also incorporate the ecosystem services approach. The new NCAs have not been finalised at the time of publication of this document. It is understood however, that the boundaries will be the same as for the previous NAs in the East Riding.

1.2.2 There are five NA/NCAs which are wholly or partly with the East Riding. Holderness NA covers much of the east and south-east of the County and is bounded to the west by the Yorkshire Wolds NA. The Wolds extend in an arc north-eastwards from the Humber, through the centre of the County to the North Sea. To the west of the Yorkshire Wolds lies the Vale of York NA. This merges into the Humberhead Levels NA in the southwest corner of the County. The Humber Estuary NA lies along the southern boundary of the County. The following summary descriptions of these areas are based on the NA profiles developed by Natural England.

1.3 Holderness Natural Area

1.3.1 Holderness NA is wholly contained within the East Riding.

1.3.2 Holderness is a low-lying plain comprised of glacial deposits, predominantly tills, boulder clays and lake clays. Locally these are interspersed with sand and gravel for example at Brandesburton and peat filled depressions (“meres”) which are the sites of former lakebeds. The area has an open, rural agricultural character of mixed, mainly arable farming, large fields and sparse woodland cover. There is an extensive network of drainage ditches.

1.3.3 The western landscape of Holderness is dominated by the River Hull, which has nationally important chalk stream headwaters, grading to tidal river between Beverley and Driffield. There are many valuable wildlife habitats associated with the upper reaches of the Hull, including floodplain grassland and marsh, alder

and willow carr, water crowfoot beds and remnant fen and swamp. These habitats are of particular value to breeding birds such as lapwing, redshank, yellow wagtail, sedge warbler, reed warbler and reed bunting. Native brown trout and otter populations are significant as are the water voles, which are still present in reasonable numbers, as well as populations of water shrew.

- 1.3.4 In the lower more tidal reaches there is less semi-natural habitat. The river is contained within flood banks and several stretches are also perched above the surrounding farmland.
- 1.3.5 A number of small watercourses flow across Holderness into the Humber Estuary east of Hull, including the Lambwath stream, Holderness Drain, Hedon Haven and Patrington Haven. Water vole has several strongholds on the network of drainage channels.
- 1.3.6 Fens and swamp are also found along the fringes of the Leven Canal SSSI and Hornsea Mere SSSI/SPA. Hornsea Mere, at 120ha, is the largest natural lake in Yorkshire. It is internationally important for wintering wildfowl, especially gadwall and goldeneye and it supports large numbers of little gulls in the autumn.
- 1.3.7 More recently sand and gravel extraction in Holderness, particularly near Keyingham and Brandesburton, has left new open water and marginal habitats some of which are developing into valuable wildlife habitat.
- 1.3.8 Unimproved neutral grassland is a scarce resource in Holderness, with a concentration in the Lambwath stream valley. Other significant areas of semi-natural neutral grassland are found on the Beverley commons and to the south of Cottingham in the Priory Road and Anlaby Common areas.
- 1.3.9 Woodland and scrub are scarce in Holderness. There is less than 100ha of ancient woodland, an even smaller area of which is semi-natural. Woodland at Burton Constable is noted for its populations of both white-lettered and purple hairstreak butterflies. Coastal scrub, woodlands and hedgerows are also important resting sites for migrant birds.
- 1.3.10 The farmland of Holderness is mainly intensively managed arable and grassland, with wheat and oil-seed rape the principal crops. Holderness supports good populations of farmland birds including tree sparrow, barn owl and corn bunting.

1.4 Yorkshire Wolds Natural Area

- 1.4.1 About two-thirds of the Yorkshire Wolds NA is contained within the East Riding.
- 1.4.2 The Yorkshire Wolds is the northern-most chalk outcrop in the England and is an area rich in geological features with some highly significant remnant ecological features. It is characterised by rounded, undulating hills, up to 250m and incised dry valleys. There are steep escarpments to the north and west. The gradual dip slope to the east merges into the Holderness Plain. On the south-western edge of the Wolds there is a small area of limestone.

- 1.4.3 Land-use across the Wolds is predominantly arable and woodland cover is sparse. On the plateau the fields are generally large and originate from the enclosure acts of the early nineteenth century. Chalk grassland, although the most important and characteristic semi-natural habitat of the NA, now comprises only 1.3% of the land area. The majority of the best examples are covered by the 20 SSSIs, designated for this habitat. The chalk streams, springs and flushes are some of the other rich habitats of the NA.
- 1.4.4 The grassland varies from tall/tussocky grassland to well grazed sheep walk. In many of the dry valleys the grassland is becoming dominated by tor grass which supports a less species-rich sward than the finer grasses. There are also significant variations in floral composition depending on the aspect and depth of the soil profile, which tends to be thicker at the bottom of the slope. Characteristic chalk grassland species of the NA include common rock-rose, clustered bellflower and common milkwort. More localised are species like perennial flax which tend to be restricted to south-facing slopes, or south-westerly-facing shoulders. In addition to the plants, the chalk grasslands are very important for invertebrates, especially butterflies and moths, such as the marbled white, brown argus and cistus forester.
- 1.4.5 Wide road verges are a characteristic feature of the Wolds and are an important reservoir of calcareous grassland species.
- 1.4.6 Some man-made habitats such as quarries and railway cuttings support a range of chalk grassland flora and fauna. Disused quarries can be an important biodiversity resource with the Kiplingcotes Quarry being a SSSI and a Yorkshire Wildlife Trust (YWT) reserve.
- 1.4.7 Springs and flushes occur in the valleys, along the western escarpment of the Wolds and along the coastline. At the richer sites plants such as marsh valerian, marsh marigold, bogbean, butterwort and marsh orchids are found. In a few places, such as Millington Wood and Pastures SSSI, more extensive spring-fed fens have developed.
- 1.4.8 There are both constant and winterbourne chalk streams on the Wolds, which are of great ecological significance, notably the headwaters of the Hull which are designated as a SSSI and the Gypsy Race. The constant chalk streams support water crowfoot beds. Close to their source these streams often harbour a specialised cold water fauna which depends upon the stable temperature regime.
- 1.4.9 There were once widespread dewponds in the Wolds dating from the time when it was a more pastoral landscape, but now only a small number remain. These may be important for populations of amphibians, fresh water invertebrates and species of aquatic and marginal plants which are scarce elsewhere within the natural area.
- 1.4.10 Woodland cover is limited and mainly comprises scattered shelterbelts and small areas of disturbed secondary woodland. There is a cluster of woodland on the foothills of the western scarp and along the Gypsy Race near Boynton. Millington Wood SSSI is the best of the few examples of ancient woodland in the

area and baneberry occurs there. Baneberry is restricted to three regions of Britain. A small population of Red Kite breeds in the NA.

1.4.11 In localised areas gorse and hawthorn scrub is an important feature, supporting breeding populations of linnets and grey partridge. Long eared owl is another species associated with the Wolds scrub habitats.

1.4.12 Parklands on the large estates, such as Dalton, Londesborough, Thorpe Park, and Hotham Hall support a mosaic of permanent pasture with large mature trees and woodlands.

1.5 Vale of York Natural Area

1.5.1 A small area of the Vale of York lies in the west of the East Riding.

1.5.2 The Vale of York is a low-lying flat floodplain area with scattered glacial ridges and moraines. The solid Sherwood Sandstone and Mercia Mudstone geology is overlain by a variety of drift deposits and soils are a variety of river alluvium, boulder clay and sand. The River Derwent and its associated grassland and wetland habitats is a key feature of the Vale of York and it forms the boundary between the City of York and the East Riding in this NA.

1.5.3 Outside of the Derwent Valley arable agriculture is the dominant land use although in places the many streams and drainage channels are key features of the landscape. There are extensive areas covered by wind-blown sands from the end of the last ice-age. These areas support a few remnants of lowland heathland and other sandy habitats, which were formerly more extensive. There are also scattered woodlands and a few parklands within the area.

1.5.4 In the Vale of York NA the River Derwent has a more typical lowland character. The full length of the River in the East Riding is designated as SSSI and SAC. It has a rich aquatic flora and is also valuable for its invertebrate and fish communities. A number of nationally scarce invertebrates have been recorded on the Derwent. It is also a stronghold for the otter.

1.5.5 There are a number of valuable wetland habitats in the East Riding section of this NA, many of which are associated with the River Derwent and some of which are designated as SSSI, SAC and SPA. There is a concentration of fen meadow in the Lower Derwent around Melbourne and Thornton Ings SSSI, parts of which are in the East Riding. Tall herb fen is more widespread although there are few stands of significant size. The fen flora on drainage banks and many of the swamp communities are also often of considerable value for wildlife.

1.5.6 The “Ings” or flood meadows of the Vale of York are grasslands managed for hay and livestock grazing. The meadows, wet grassland and dykes of the valley make the area of exceptional importance for breeding and wintering wildfowl and waders.

1.5.7 Lowland grass heath and other sandy habitats are found in the area around Allerthorpe, notably Allerthorpe Common, part of which is a SSSI. These heaths are characterised by mosaics of heather, humid and dry acid grassland, bracken,

gorse, birch and oak woodland, cotton grass and rush pasture. Allerthorpe supports characteristic bird species, such as tree pipit and woodlark, as well as reptiles including adder and common lizard.

- 1.5.8 Woodland cover in the Vale of York is low. Woodland is mainly plantation and secondary in small to medium stands. Hedgerows are mainly Enclosure period but ancient hedgerows do occur. The NA also supports a number of old parkland areas with veteran trees such as Everingham Park.
- 1.5.9 Small field ponds were once widely distributed in the NA but many have been lost to agricultural intensification. Great crested newts are widely but thinly distributed across the ponds of the NA and there are also populations of palmate newt.

1.6 Humberhead Levels Natural Area

- 1.6.1 The north-east corner of the Humberhead Levels NA occupies the south-west corner of the East Riding.
- 1.6.2 The Humberhead Levels is an open flat plain, parts of which are below sea level, where agriculture is artificially maintained by pumping regimes. Soils are a mixture of alluvium, clay, sand/gravel and peat. It is a rural agricultural area with few major settlements.
- 1.6.3 The East Riding portion of the Humberhead Levels is a mixture of arable agriculture and grassland, bisected by the tidal River Ouse. The patchwork of fields, of a range of sizes, is divided variously by dykes and hedges.
- 1.6.4 The northern third (634 ha) of Thorne, Crowle and Goole Moors SSSI, SAC and SPA falls within the East Riding. Thorne Moors is the largest expanse of lowland raised peat bog remaining in the UK. Characteristic plant species include sphagnum mosses, heather, cranberry, cross-leaved heath and cotton grass. Round-leaved sundew, bog rosemary and bog myrtle also occur.
- 1.6.5 Heathland habitats occur in the NA, notably South Cliffe Common SSSI. This heathland on glacial sands is similar to that found at Allerthorpe in the Vale of York and is characterised by its mosaic of ericaceous communities, bracken, gorse, birch and oak woodland, cotton grass and rush pasture.
- 1.6.6 Concentrations of other ecologically rich habitat are found in the west on the lower reaches of the River Derwent, around Derwent Ings and Brighton Meadows SSSIs. The seasonally inundated meadows of the valley make the area of exceptional importance for wintering and wildfowl and waders particularly teal, wigeon, pochard, golden plover and ruff. Notable breeding birds include garganey, corncrake and black-necked grebe. The Ramsar citation also lists the invertebrate fauna as being of importance, 16 species of dragonflies and damselflies and 11 other red data book invertebrate species.
- 1.6.7 Some of the dyke banks support quite a rich fen flora including species such as creeping jenny, yellow loosestrife and meadow rue.

- 1.6.8 Further away from the floodplains where the grassland is drier there are still wildflower-rich hay meadows to be found, characterised by cowslips, great burnet, saw-wort, knapweed and meadow vetchling. Barn owl and quail are notable bird species associated with this habitat.
- 1.6.9 Small areas of estuarine reedbeds and saltmarsh are localised features of this NA. The reedbeds support breeding marsh harrier and bearded tit. Heathland habitat occurs at Thorne Moors SSSI where a significant population of nightjar thrives, a rich invertebrate fauna and a population of adders.
- 1.6.10 Ponds and lakes are scattered through the area. Most of the lakes are areas of old gravel working, which can be valuable for waders and wildfowl and a small number of them are mesotrophic in nature.

1.7 Humber Estuary Natural Area

- 1.7.1 The Humber Estuary is about 60km long and 14km wide at its widest. The northern half of the estuary is in the East Riding; the southern half is in North Lincolnshire and North East Lincolnshire.
- 1.7.2 The Humber Estuary is a low-lying area of glacial till overlain by alluvial deposits. It is a mixed landscape of intensive agriculture, modern industrial development and coastal influences. Kingston-upon-Hull and several significant port developments give a strong urban and industrial feel to parts of the NA. The most visually distinctive natural features of the area are the extensive mud flats and the Spurn Peninsula at the mouth of the estuary.
- 1.7.3 The main ecological features of the estuary are water, mudflats, saltmarsh, sand dunes and shingle. There are also reedbeds, wet grassland and swamp. The estuary is important for lamprey, eels, whiting, sole, flounder and as a nursery area for plaice.
- 1.7.4 There is an estimated area of around 8,060 ha of intertidal mudflats in the East Riding, the largest being Spurn Bight (about 3,000 ha). There is also a narrower but still extensive area between Hawkins Point and Thorngumbald. The nutrient-rich mudflats of the intertidal zone support a considerable diversity and biomass of invertebrates. In turn this attracts large numbers of birds.
- 1.7.5 The Humber Estuary is one of the top five important bird sites in the UK and it is one of the top ten in Europe. The Estuary supports internationally important populations of dark-bellied brent geese, shelduck, golden plover, grey plover, and knot. The intertidal parts of the estuary are designated as a SSSI and also an SPA and Ramsar. The whole estuary, including the sub-tidal parts is designated as a SAC.
- 1.7.6 The sandy beaches are the less fertile areas of the intertidal zone although there are still a number of specialist invertebrates and birds found in this habitat. The strandline is often the richest area.
- 1.7.7 Saltmarsh is found in the transition zone between intertidal and land-based habitats. There are approximately 468 ha in the East Riding. The northern shore

of the Humber is fringed with saltmarsh at a number of places from Spurn to Broomfleet, the largest area being at Welwick Saltmarsh.

- 1.7.8 The area of inter-tidal habitats in the estuary has been extended at Welwick and Paul Holme Strays through managed realignment of the flood bank. This process can be driven by the need for the estuary to adapt to rising sea levels due to climate change. It may also be driven by the need to provide compensatory habitats under the Habitats Regulations for port related developments.
- 1.7.9 Reedbeds fringe some areas of the Humber Estuary, notably at Blacktoft Sands at the confluence of the Trent and the Ouse. The larger Humber reedbeds can support marsh harrier, bittern and bearded tit. There is also a considerable amount of reedbed in the drainage ditch networks behind the sea wall. These smaller reedbeds are important for birds such as water rail, reed warbler and sedge warbler.
- 1.7.10 Sand dunes and sandy shingle habitats occur at Spurn, where there are both mobile and semi-fixed dunes. A combination of grassland and scrub is found on the semi-fixed dunes.
- 1.7.11 Further out from the estuary coast arable farming and market gardening are the main rural land-uses on land which is reclaimed grazing marsh, saltmarsh and mudflat. It is an open landscape with large rectangular fields and ditches as the boundaries. There are remnant areas of freshwater reedbeds, wet grassland and swamp which are valuable for their invertebrate communities, and they also provide complementary habitat for some of the overwintering estuary birds.

2. Development of the LWS Site Selection Guidelines

2.1 Designation of SINCs

2.1.1 The development of the site selection guidelines has been an iterative process. The original SINC

s were designated on the basis of qualitative judgement, rather than objective criteria. The review of SINCs which began in 2001 identified the need for a more objective site selection process.

2.2 Development of the LWS System

2.2.1 A contract was awarded to consultants Baker, Shepherd, Gillespie to develop draft site selection guidelines. The draft they prepared was based on the approach developed for site selection guidelines in North Yorkshire. The first draft was revised and a third draft was prepared by Alison Fraser, Peter Shepherd and Robert Masheder in March 2003. This document formed the basis for subsequent development of the guidelines.

2.2.2 The comprehensive review of former SINC sites began in 2007 with the formation of the current LWS Panel. The Panel used the third draft as the basis for assessing Candidate Sites. This process also enabled the guidelines to be tested against real survey data and revised to make them more relevant to the ecology of the East Riding. During the site assessment process the Panel recommended various revisions to the guidelines and also identified the need for some entirely new guidelines e.g. Gr6 for grasslands on verges.

2.2.3 A report on the Local Sites System was approved by the Council's Cabinet in March 2010. This report recommended the approval of the Local Sites System, including reporting mechanisms (the former NI 197) and process for the adoption and de-selection of LWS. The report also recommended the formal adoption of the first tranche of LWS, affording them material consideration in the planning process, as well as de-selecting some sites that did not meet the guidelines.

2.2.4 The requirement for a single document to formalise the site selection guidelines and the procedures for the management of the LWS system was agreed by the Panel in August 2011. The key driver for this was the development of the Local Plan, which is the key spatial planning document for the East Riding of Yorkshire. The Plan was in preparation at that time and therefore there was an opportunity for the Local Sites document to form part of the evidence base for the Local Plan.

2.2.5 Part A of this document therefore sets out the detailed processes and procedures for the management of the LWS system in line with principles described in the Cabinet Report of March 2010.

2.2.6 The preparation of this document started in autumn 2011 with a review of the draft site selection guidelines and the revisions recommended by the Panel. This led to the development of draft revised guidelines for habitats and species. These were subject to a series of consultations with the Panel and relevant local naturalists during early 2012.

2.2.7 The 2006 Defra Guidance included guidance on Community Value Guidelines. This was a new area for LWS in the East Riding and the Panel were consulted on a number of options for the development of such guidelines.

3. Guidelines for the Selection of Local Wildlife Sites – Habitat Guidelines

3.1 Grassland and Heathland

3.1.1 Background

Grasslands included under this set of habitat guidelines are traditionally managed meadows and pastures of the lowlands and the Wolds on neutral, acid and calcareous soils. Heathlands are lowland heathlands in the Vale of York and Humberhead Levels NAs.

3.1.2 Neutral Grassland

Two UK Biodiversity Action Plan (BAP) habitats: ‘Lowland Meadow and Pasture’; and ‘Coastal and Floodplain Grazing Marsh’ are found in the East Riding.

Unimproved neutral grassland habitat underwent a major decline in the 20th century. It was estimated in 1994 that in England there is significantly less than 10,000ha of species-rich neutral grassland¹. As a result this habitat now remains in small sites with a localised and fragmented distribution throughout much of the UK.

Neutral grasslands support a high proportion of broad-leaved herbaceous species relative to grasses. Characteristic species include meadow crane’s-bill, yellow rattle, pignut and red clover. Scarce species include green-winged orchid, pepper saxifrage, dyer’s greenweed and adder’s-tongue fern.

In lowland areas species-rich neutral grasslands, as described in the Habitat Action Plan for Lowland Meadows and Pasture, 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.²

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.

¹ UK Biodiversity Steering Group (1995). Biodiversity: the UK steering group report. Volume 2: Action Plans. HMSO, London.

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

In the East Riding there is approximately 105ha of unimproved species-rich neutral grassland. A useful breakdown of the occurrence and estimated cover of species-rich neutral grassland for the region 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).

The majority of the unimproved neutral grassland in the East Riding is found in the Vale of York and Mowbray and the Humberhead Levels Natural Areas (NAs), with concentrations in the Lower Derwent Valley. However small pockets of this habitat are also found in the Holderness NA (especially along the River Hull) and the Yorkshire Wolds NA where thicker soil profiles mask the influence of the chalk. The main NVC communities are: MG4 (typical flood meadow community) and MG5 (on the drier ground), but MG9 and MG13 also occur.

3.1.3 Acid Grassland

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. In most circumstances they are managed as grazing pasture, but in some instances they may be maintained by rabbit grazing alone.

Lowland dry acid grassland occurs on free-draining acidic soils often associated with acidic rocks, alluvial sands and gravels and blown sand. Characteristic plant species include heath bedstraw, sheep's fescue, sheep's sorrel, common bent grass, wavy hair-grass, tormentil and heather species at low abundance. In the UK there is estimated to be only 30,000ha of lowland dry acid grassland. It is not an extensive habitat in the East Riding, but pockets of it are found in the Vale of York and Mowbray NA, the Yorkshire Wolds NA (south western edge foothills) and the Humberhead Levels NA. These sites are likely to support U1, U2 and U4 grasslands.

In lowland areas with poorly drained acidic soils, purple moor-grass and rush pasture communities (M23 and M25) develop, often in a mosaic with other habitats such as wet heath. These communities are included in the fen Guideline Fe1. These communities are present in the Vale of York and Mowbray and Humberhead Levels Natural Areas in the East Riding, but are rare.

3.1.4 Calcareous Grassland

Calcareous grassland occurs on shallow lime-rich soils usually derived from limestone rocks. In the East Riding of Yorkshire these occur mainly on the Cretaceous chalk. It also occurs on the much smaller Jurassic limestone outcrop on the western edge of the Wolds.

It is estimated that 55-66,000ha of calcareous grassland occurs in the UK of which 33,000-41,000ha lies within the lowlands.³ 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 with scattered occurrences elsewhere, including notably the lowland chalk grasslands of the Yorkshire Wolds NA. The Yorkshire Wolds is the most northerly chalk outcrop in the England.

It is estimated that the East Riding has less than 530 ha⁴ of unimproved/semi-improved calcareous grassland. These fall into the NVC plant communities CG4 (*Brachypodium pinnatum* grassland), CG2 (*Festuca ovina* – *Avenula pratensis* grassland), CG3 (*Bromus erectus* grassland), CG7 (*Festuca ovina* – *Hieracium pilosella* – *Thymus praecox/pulegioides* grassland) and CG5 (*Bromus erectus* – *Brachypodium pinnatum* grassland).

Calcareous grassland formerly dominated much of the Yorkshire Wolds before the open downland was enclosed for arable during the eighteen and nineteenth centuries. It is now largely confined to the steep-sided valleys. It can support a very rich flora including many locally and nationally rare species. Characteristic species include: cowslip, oxeye daisy, common rockrose and wild thyme. Less common species found on some of the richer sites include: purple milk-vetch, autumn gentian and knapweed broomrape. Invertebrate faunas can also be very rich, including nationally scarce species and those at the northern limit of their range, such as marbled white butterfly. Calcareous grassland in the Wolds is under threat, both from scrub encroachment and the spread of Tor grass, which supports a much less species-rich sward.

3.1.5 Species Rich Verges

In many places in the East Riding of Yorkshire the formerly extensive unimproved grassland habitats have been replaced by intensive arable agriculture. In these landscapes, verges of roads and other linear habitats can often support important remnants of more species rich grassland. In some cases, such as old drove roads, the verges can be quite wide, providing a larger area of habitat. The differing characteristics of the geology and soils in the different NAs produces different grassland communities with varying levels of typical species richness. The chalk grassland verges of the Yorkshire Wolds NA can be particularly species rich, hence the higher threshold score for this area. In the other NAs species richness depends on local conditions and in some areas species rich verges are very localised and therefore a lower threshold is justified for these.

³ UK Biodiversity Group Tranche 2 Action Plans. Volume II – terrestrial and freshwater habitats (1998). HMSO, London.

⁴ English Nature (1995), The Grassland Inventory Humberside (derived estimate based on 100% of any CG, CG/MG or CG/MG/U sites falling in the East Riding of Yorkshire).

3.1.6 Heathland

Heathland comprises areas of low growing shrubs such as heathers and gorse, which may occur in a mosaic with acid grassland and various types of woodland. Heathland typically forms on acid sandy or peaty soils. In the East Riding extensive areas formerly occurred on sands in the Vale of York, especially those west of the Yorkshire Wolds scarp slope. Most of this formerly extensive area of heathland was converted to agriculture or forestry during the nineteenth and twentieth centuries. Consequently the remaining patches of this habitat are relatively small and fragmented. They do however still provide a valuable ecological resource and have enabled some heathland specialists such as the woodlark *Lullula arborea* to re-colonise the East Riding of Yorkshire.

3.1.7 Selection Criteria and Attributes

Table 1 below sets out selection criteria and attributes for the designation of grassland and heathland LWS in the East Riding of Yorkshire.

Table 1: Selection criteria and attributes for grassland LWS

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 NA 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, NA or locality.
Diversity	Number of grassland plant species recorded as a total and presence of characteristic grassland species.
Rarity	Presence of nationally threatened 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 and 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. neutral (Table 2), calcareous (Table 3), and acid (Table 4). Nationally rare, declining or scarce plant species are included in the lists, where appropriate, and they are also the subject of separate selection guidelines for rare plants (see Section 4).

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.

There is no minimum size threshold as even very small areas may be species-rich and valuable. Site boundaries should adhere to minimum mapping units based on OS Mastermap or clearly defined managed units.

Species which are believed to be 'non-native' in origin or present due to unauthorised introductions should be disregarded.

3.1.8 General application to all grassland and heathland guidelines

The following guidelines are applicable to grassland communities that have developed naturally. Recently sown 'wildflower meadows' (i.e. sown within the last 25 years) are not eligible for consideration under these guidelines. Grassland communities that occur on road verges, disused quarries and 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, have been included under neutral grassland or the fen, lowland acid mires, springs and flushes guidelines.

The species listed in Tables 2, 3 and XXGW 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 that these species are largely restricted to good examples of the semi-natural grassland communities in the East Riding. Commonly occurring species such as false oat grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*) and cock's-foot (*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.

There is no minimum size specified for sites as even small patches of habitat may be species rich and important in the context of the area. The selection of a grassland LWS using the species lists in the tables should normally ensure that the characteristic species recorded exhibit a reasonable distribution throughout the sward in all or a significant proportion of the site. However in some cases where the characteristic species have become localised due to management practices the site should still be considered for designation as an LWS. This is because parts of the site still support the characteristic vegetation and changes in management may help restore a more species rich sward across the site. Such sites which still support key indicator species are a high priority for conservation and therefore worthy of designation as LWS. This is especially relevant when considering large chalk grassland sites in the Wolds NA.

3.1.9 Grassland and Heathland Selection Guidelines

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

Gr1

Areas of ancient semi-natural neutral or calcareous grassland that support stands of one or more of the following NVC community types:

MG4 *Alopecurus pratensis-Sanguisorba officinalis*

MG5 *Cynosurus cristatus – Centaurea nigra*

MG8 *Cynosurus cristatus-Caltha palustris*

CG2 *Festuca ovina-Avenula pratensis*

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. Only sites that show a good affinity with the relevant NVC community will be selected. The degree of affinity to the NVC community will be determined by a competent surveyor and the LWS Panel.

Rationale

These grassland communities represent some of the rarest and most endangered grassland types in the UK and the East Riding. The presence of these communities also indicates that grassland has not been significantly 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 grasslands communities are now restricted to small areas, but often continue to support rare localised species.

Gr2

Areas of old, established semi-natural neutral and calcareous grassland that score 12 or more from the neutral grassland plant species in Table 2 or the calcareous grassland species listed in Table 3.

Application

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 records must score 12 or more from either Tables 2 or 3.

Rationale

Long-established species-rich semi-natural grasslands have declined considerably throughout the UK and the East Riding over the last 50 years.

Gr3

Areas of acid grassland that score 8 or more from the acid grassland plant species list in Table 4.

Application

This guideline applies to dry and wet acid grassland communities. These communities may occur in combination with lowland heath and mire habitats.

Rationale

Acid grassland is a rare habitat in the East Riding. It is largely restricted to remnants on sandy areas of the Vale of York and Humberhead Levels NAs.

Gr4

Areas of semi-natural grassland that score 20 or more from the acid, neutral and calcareous grassland plant species listed in Tables 2, 3 and 4 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 or semi-improved grassland. Unimproved or semi-improved grassland should cover the majority of the site.

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 soil type to another and a variety of hydrological conditions. These grasslands can be extremely valuable and diverse, but are difficult to classify under a single grassland habitat type.

Gr5

Areas of semi-natural grassland that adjoin or lie within 500m of another site that is designated as a SSSI, SAC or LWS and have a score within 20% of the thresholds listed in the other grassland guidelines.

Application

This guideline should be applied to sites that are in close proximity to other designated grasslands. The sites do not have to be of the same habitat type.

Rationale

The role and importance of habitat connectivity has been well studied, in relation to population dynamics and rates of extinction, immigration and emigration of individuals from one habitat patch to another. The value of habitats patches as stepping stones is recognised in the EU 'Habitats' Directive (92/43/EEC). This guideline enables grasslands to be designated, which although they are below the threshold for species richness, may make an important contribution to habitat networks within an area. The habitat networks may include hedgerows and mixed habitats which contribute to the overall ecological diversity and connectivity of an area.

Gr6

Old established semi-natural grassland verges should be designated as LWS if they meet either of the following:

- a) Are situated within the Yorkshire Wolds NA and score 12 or more derived from the species in listed in Table 5.
- b) Are situated within the Holderness, Vale of York, or Humberhead Levels NA and score 9 or more derived from the species listed in Table 5.

Application

This guideline should only be applied to either ancient or long-established semi-natural grass verges of natural origin. Grasslands known to be of recently sown origin are not eligible under this guideline. The guideline can be applied to verges that occur adjacent to roads, railways (used or disused), cuttings and embankments, tracks, green lanes, towpaths, footpaths or bridleways. The guideline may include only the grassland element of the verge, or other habitats such as hedgerows and ditches if these make a significant contribution to the overall biodiversity of the site. Verges that have high structural habitat diversity, but lower species diversity should be considered against the relevant mixed habitat guideline.

Rationale

Long-established species-rich semi-natural grasslands have declined considerably throughout the UK and the East Riding over the last 50 years. Areas of semi-natural species-rich grasslands on verges have often not been subject to the same intensification of grassland management which has occurred within agricultural fields. They may therefore have survived as a relic of a grassland habitat that was once much more widespread in the wider agricultural landscape.

Verges are valuable as linear habitat corridors linking other sites within the wider landscape, increasing connectivity and allowing movement of species between grassland sites. This is especially important given the potential effects of climate change upon the distribution of species.

Many verges also contain a variety of species typical of a range of habitat types and therefore biodiversity can be especially high. Verges can support species associated with woodland edge, understory, open grassland and wetlands.

The NAs in the East Riding support different grassland communities based on soils and geology. The chalk grassland verges in the Yorkshire Wolds are generally more species rich than those on clay, such as in the plain of Holderness.

He1

Areas of semi-natural lowland heathland that have a cover of at least 25% of dwarf shrubs comprising any of the following species:

common heather *Calluna vulgaris*
 bell heather *Erica cinerea*
 cross-leaved heath *Erica tetralix*
 gorse *Ulex europaeus*

Application

This guideline should be applied to any site that supports a heathland community. In the case of Gorse *Ulex europaeus* sites should only be designated where at least one other dwarf shrub species from the guideline covers at least 5% of the site and gorse does not cover more than 50% of the site.

Rationale

Remnants of heathland habitat are very rare in the East Riding and all examples are valuable. The 25% threshold is the definition used in the UK BAP to differentiate heathland from acid grassland priority habitats. The revised approach for gorse recognises that although this species can be an important component of heathland sites, it can also be a significant management issue and can dominate sites to the detriment of other important species. Generally gorse mono-cultures have low ecological value.

Table 2: Plant species of semi-natural neutral grassland.

Scientific name	Common name	Comments
<i>Achillea ptarmica</i>	sneezewort	
<i>Agrimonia eupatoria</i>	agrimony	
<i>Ajuga reptans</i>	bugle	
<i>Alchemilla spp (native)</i>	lady's mantle spp	1 point each
<i>Anemone nemorosa</i>	wood anemone	
<i>Anthoxanthum odoratum</i>	sweet vernal-grass	
<i>Avenula pratensis</i>	meadow oat-grass	
<i>Avenula pubescens</i>	downy oat-grass	
<i>Betonica officinalis</i>	betony	
<i>Briza media</i>	quaking grass	
<i>Caltha palustris</i>	marsh marigold	
<i>Campanula rotundifolia</i>	harebell	
<i>Cardamine pratensis</i>	lady's smock	
<i>Carex spp</i>	<i>Carex spp</i>	except <i>Carex hirta</i> , 1 point each
<i>Centaurea nigra</i>	black knapweed	
<i>Conopodium majus</i>	pignut	
<i>Cynosurus cristatus</i>	crested dog's-tail	
<i>Dactylorhiza spp.</i>	any marsh orchid species	2 points each
<i>Equisetum telmateia</i>	great horsetail	

Scientific name	Common name	Comments
<i>Euphrasia</i> spp.	eyebright spp	1 point each
<i>Filipendula ulmaria</i>	meadowsweet	
<i>Galium palustre</i>	common marsh-bedstraw	
<i>Galium verum</i>	lady's-bedstraw	
<i>Geranium pratense</i>	meadow cranesbill	
<i>Gymnadenia conopsea</i>	Chalk fragrant orchid	
<i>Hordeum secalinum</i>	meadow barley	
<i>Hypericum tetrapterum</i>	square-stalked St John's-wort	
<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>Leucanthemum vulgare</i>	ox-eye daisy	
<i>Lotus corniculatus</i>	bird's-foot trefoil	
<i>Lotus pedunculatus</i>	greater birds-foot-trefoil	
<i>Lysimachia nummularia</i>	creeping jenny	
<i>Ophioglossum vulgatum</i>	adder's-tongue fern	
<i>Orchis morio</i>	green-winged orchid	
<i>Persicaria bistorta</i>	common bistort	
<i>Pimpinella saxifraga</i>	burnet-saxifrage	
<i>Plantago media</i>	hoary plantain	
<i>Poterium sanguisorba</i> ssp. <i>sanguisorba</i>	salad burnet	
<i>Primula veris</i>	cowslip	
<i>Primula vulgaris</i>	primrose	
<i>Ranunculus bulbosus</i>	bulbous buttercup	
<i>Rhinanthus minor</i>	yellow rattle	
<i>Sanguisorba officinalis</i>	great burnet	
<i>Scorzonerooides autumnalis</i>	<i>Scorzonerooides autumnalis</i>	
<i>Silaum silaus</i>	pepper saxifrage	
<i>Silene flos-cuculi</i>	ragged robin	
<i>Stellaria graminea</i>	lesser stichwort	
<i>Succisa pratensis</i>	devil's-bit scabious	
<i>Trifolium medium</i>	zigzag clover	not the agricultural variety
<i>Trisetum flavescens</i>	yellow oat-grass	

Key: Species in bold score 2.

Table 3: Plant species of semi-natural calcareous grasslands.

Scientific name	Common name	Comments
<i>Agrimonia eupatoria</i>	agrimony	1 point each
<i>Alchemilla</i> spp (native)	lady's mantle spp	
<i>Anacamptis pyramidalis</i>	pyramidal orchid	
<i>Anthyllis vulneraria</i>	kidney vetch	
<i>Arabis hirsuta</i>	hairy rock-cress	
<i>Astragalus danicus</i>	purple milk vetch	
<i>Avenula pratensis</i>	meadow oat-grass	
<i>Avenula pubescens</i>	downy oat-grass	
<i>Blackstonia perfoliata</i>	yellow-wort	

Scientific name	Common name	Comments
<i>Brachypodium rupestre</i>	tor grass	
<i>Bromopsis erecta</i>	upright brome	
<i>Briza media</i>	quaking grass	
<i>Calamintha acinos</i>	basil thyme	
<i>Campanula glomerata</i>	clustered bellflower	
<i>Campanula rotundifolia</i>	harebell	
<i>Carex spp</i>	<i>Carex spp</i>	except <i>C. hirta</i> , 1 point each
<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>Conopodium majus</i>	Pignut	
<i>Cornus sanguinea</i>	dogwood	
<i>Dactylorhiza fuchsii</i>	common spotted orchid	
<i>Dactylorhiza purpurella</i>	northern marsh orchid	
<i>Daucus carota</i>	wild carrot	
<i>Echium vulgare</i>	viper's bugloss	
<i>Euphrasia spp</i>	eyebright spp	1 point each
<i>Festuca ovina</i>	sheep's fescue	
<i>Filipendula vulgaris</i>	dropwort	
<i>Fragaria vesca</i>	wild strawberry	
<i>Galeopsis angustifolia</i>	red hemp-nettle	
<i>Galium verum</i>	lady's bedstraw	
<i>Genista tinctoria</i>	dyer's greenweed	
<i>Gentianella amarella</i>	autumn gentian	
<i>Geranium sanguineum</i>	bloody cranesbill	
<i>Gymnadenia conopsea</i>	Chalk fragrant orchid	
<i>Helianthemum nummularium</i>	common rockrose	
<i>Hippocrepis comosa</i>	horseshoe vetch	
<i>Hypericum hirsutum</i>	hairy St John's wort	
<i>Hypericum perforatum</i>	perforate St John's wort	
<i>Koeleria macrantha</i>	crested hair-grass	
<i>Leontodon hispidus</i>	rough hawkbit	
<i>Orchis mascula</i>	early purple orchid	
<i>Origanum vulgare</i>	wild marjoram	
<i>Orobanche elatior</i>	knapweed broomrape	
<i>Picris hieracioides</i>	hawkweed oxtongue	
<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</i>	spring cinquefoil	
<i>tabernaemontani</i>		
<i>Poterium sanguisorba ssp.</i>	salad burnet	
<i>sanguisorba</i>		
<i>Primula veris</i>	cowslip	
<i>Rhamnus cathartica</i>	purging buckthorn	
<i>Rhinanthus minor</i>	yellow rattle	

Scientific name	Common name	Comments
<i>Rosa spinosissima</i>	burnet rose	
<i>Scabiosa columbaria</i>	small scabious	
<i>Serratula tinctoria</i>	saw-wort	
<i>Spiranthes spiralis</i>	autumn lady's tresses	
<i>Succisa pratensis</i>	devil's bit scabious	
<i>Thymus polytrichus</i>	wild thyme	
<i>Thymus pulegioides</i>	large thyme	
<i>Trisetum flavescens</i>	yellow oat-grass	
<i>Viola hirta</i>	hairy violet	

Key: Species in **bold** score 2

Table 4: Plant species of semi-natural acid grassland.

Scientific name	Common name	Comments
<i>Achillea ptarmica</i>	sneezewort	
<i>Agrostis canina</i>	velvet bent	
<i>Aira caryophylla</i>	silvery hair-grass	
<i>Aira praecox</i>	early hair-grass	
<i>Arenaria serpyllifolia</i>	Thyme-leaved sandwort	
<i>Betonica officinalis</i>	betony	
<i>Calluna vulgaris</i>	heather	
<i>Campanula rotundifolia</i>	harebell	
<i>Carex spp</i>	any sedge	1 point each
<i>Catapodium rigidum</i>	fern-grass	
<i>Centunculus minimus</i>	chaffweed	
<i>Cerastium arvense</i>	field mouse-ear	
<i>Cerastium glomeratum</i>	sticky mouse-ear	
<i>Cerastium semidecandrum</i>	little mouse-ear	
<i>Conopodium majus</i>	pignut	
<i>Dactylorhiza maculata</i>	heath spotted-orchid	
<i>Danthonia decumbens</i>	heath-grass	
<i>Deschampsia flexuosa</i>	wavy hair-grass	
<i>Elytrigia campestris</i>	neglected couch	
<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>Gentiana pneumonanthe</i>	marsh gentian	
<i>Gnaphalium sylvaticum</i>	heath cudweed	

Scientific name	Common name	Comments
<i>Hypericum humifusum</i>	trailing St John's-wort	
<i>Hypericum pulchrum</i>	slender St John's-wort	
<i>Hypochaeris radicata</i>	cat's-ear	
<i>Juncus acutiflorus</i>	sharp-flowered rush	
<i>Juncus squarrosus</i>	heath rush	
<i>Lathyrus linifolius</i>	bitter vetch	
<i>Leontodon saxatilis</i>	lesser hawkbit	
<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>Nardus stricta</i>	mat-grass	
<i>Ornithopus perpusillus</i>	bird's-foot	
<i>Pedicularis sylvatica</i>	lousewort	
<i>Pilosella officinarum</i>	mouse-ear hawkweed	
<i>Polygala serpyllifolia</i>	heath milkwort	
<i>Potentilla anglica</i>	trailing tormentil	
<i>Potentilla erecta</i>	common tormentil	
<i>Potentilla sterilis</i>	barren strawberry	
<i>Potentilla × mixta</i>	hybrid cinquefoil	
<i>Pyrola minor</i>	common wintergreen	
<i>Radiola linoides</i>	allseed	
<i>Rumex acetosella</i>	sheep's sorrel	
<i>Scleranthus annuus</i>	annual knawel	
<i>Scorzoneroideis autumnalis</i>	autumn hawkbit	
<i>Senecio sylvaticus</i>	heath groundsel	
<i>Spergularia rubra</i>	sand spurrey	
<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>Trichophorum germanicum</i>	deerglass	
<i>Trifolium arvense</i>	hare's-foot clover	
<i>Trifolium scabrum</i>	rough clover	
<i>Trifolium striatum</i>	knotted clover	
<i>Valerianella locusta</i>	common cornsalad	
<i>Veronica officinalis</i>	heath speedwell	
<i>Vicia lathyroides</i>	spring vetch	
<i>Viola riviniana</i>	common dog violet	

Key: Species in **bold** score 2.

Table 5: Plant species of semi-natural verges.

Scientific name	Common name	Comments
<i>Achillea ptarmica</i>	sneezewort	
<i>Agrimonia eupatoria</i>	agrimony	
<i>Aira caryophylla</i>	silver hair-grass	
<i>Ajuga reptans</i>	bugle	
<i>Alchemilla sp.</i>	lady's mantles	
<i>Allium ursinum</i>	ramsons	
<i>Anacamptis pyramidalis</i>	pyramidal orchid	
<i>Anemone nemorosa</i>	wood anemone	
<i>Angelica sylvestris</i>	wild angelica	
<i>Anthoxanthum odoratum</i>	sweet vernal-grass	
<i>Anthyllis vulneraria</i>	kidney vetch	
<i>Arum maculatum</i>	lords-and-ladies	
<i>Astragalus danicus</i>	purple milk-vetch	
<i>Atropa belladonna</i>	deadly nightshade	
<i>Avenula spp.</i>	oat-grasses	
<i>Betonica officinalis</i>	betony	
<i>Blackstonia perfoliata</i>	yellow-wort	
<i>Brachypodium rupestre</i>	heath false-brome	
<i>Brachypodium sylvaticum</i>	false-brome	
<i>Briza media</i>	quaking-grass	
<i>Bromopsis erecta</i>	upright brome	
<i>Calluna vulgaris</i>	heather	
<i>Campanula glomerata</i>	clustered bellflower	
<i>Campanula latifolia</i>	giant bellflower	
<i>Campanula rotundifolia</i>	harebell	
<i>Carex spp.</i>	sedges	
<i>Carlina vulgaris</i>	carline thistle	
<i>Catapodium rigidum</i>	fern-grass	
<i>Centaurea nigra</i>	common knapweed	
<i>Centaurea scabiosa</i>	greater knapweed	
<i>Centaureum erythraea</i>	common centaury	
<i>Cerastium arvense</i>	field mouse-ear	
<i>Chaerophyllum temulum</i>	rough chervil	
<i>Circaea lutetiana</i>	enchanter's-nightshade	
<i>Cirsium eriophorum</i>	woolly thistle	
<i>Coeloglossum viride</i>	frog orchid	
<i>Conopodium majus</i>	pignut	
<i>Cruciata laevipes</i>	crosswort	
<i>Cynosurus cristatus</i>	crested dog's-tail	
<i>Dactylorhiza spp.</i>	dactylorhiza spp.	1 point each
<i>Danthonia decumbens</i>	heath-grass	

Scientific name	Common name	Comments
<i>Daucus carota</i>	carrot	
<i>Echium vulgare</i>	viper's-bugloss	
<i>Equisetum telmateia</i>	great horsetail	
<i>Erodium cicutarium</i>	common stork's-bill	
<i>Eupatorium cannabinum</i>	hemp-agrimony	
<i>Euphrasia sp.</i>	eyebright(s)	
<i>Festuca ovina</i> agg.	sheep's-fescue	
<i>Filipendula ulmaria</i>	meadowsweet	
<i>Filipendula vulgaris</i>	dropwort	
<i>Fragaria vesca</i>	wild strawberry	
<i>Galium mollugo</i>	hedge bedstraw	
<i>Galium verum</i>	lady's bedstraw	
<i>Gentianella amarella</i>	autumn gentian	
<i>Geranium columbinum</i>	long-stalked crane's-bill	
<i>Geranium pratense</i>	meadow crane's-bill	
<i>Geranium pyrenaicum</i>	hedgerow crane's-bill	
<i>Geranium sanguineum</i>	bloody crane's-bill	
<i>Geum rivale</i>	water avens	
<i>Gymnadenia conopsea</i>	Chalk fragrant orchid	
<i>Helianthemum nummularium</i>	common rock-rose	
<i>Hordeum secalinum</i>	meadow barley	
<i>Hyacinthoides non-scripta</i>	bluebell	
<i>Hypericum hirsutum</i>	hairy St John's-wort	
<i>Hypericum perforatum</i>	perforate St John's-wort	
<i>Hypericum tetrapterum</i>	square-stalked St John's-wort	
<i>Hypericum x desetangsii</i>	Des Etangs' St John's-wort	
<i>Inula conyzae</i>	ploughman's-spikenard	
<i>Knautia arvensis</i>	field scabious	
<i>Koeleria macrantha</i>	crested hair-grass	
<i>Lathyrus linifolius</i>	bitter-vetch	
<i>Lathyrus pratensis</i>	meadow vetchling	
<i>Leontodon hispidus</i>	rough hawkbit	
<i>Leucanthemum vulgare</i>	oxeye daisy	
<i>Linaria vulgaris</i>	common toadflax	
<i>Linum catharticum</i>	fairy flax	
<i>Lotus corniculatus</i>	common bird's-foot-trefoil	
<i>Luzula campestris</i>	field wood-rush	
<i>Mercurialis perennis</i>	dog's mercury	
<i>Milium effusum</i>	wood millet	
<i>Moehringia trinervia</i>	three-nerved sandwort	
<i>Myosotis sylvatica</i>	wood forget-me-not	

Scientific name	Common name	Comments
<i>Neottia ovata</i>	common twayblade	
<i>Odontites vernus</i>	red bartsia	
<i>Oenanthe fistulosa</i>	tubular water-dropwort	
<i>Ononis spp</i>	restharrow	
<i>Ophioglossum vulgatum</i>	adder's-tongue	
<i>Ophrys apifera</i>	bee orchid	
<i>Orchis spp.</i>	<i>Orchis spp.</i>	1 point each
<i>Ornithopus perpusillus</i>	bird's-foot	
<i>Persicaria bistorta</i>	common bistort	
<i>Petasites hybridus</i>	butterbur	
<i>Pilosella officinarum</i>	mouse-ear-hawkweed	
<i>Pimpinella major</i>	greater burnet-saxifrage	
<i>Pimpinella saxifraga</i>	burnet-saxifrage	
<i>Potentilla erecta</i>	tormentil	
<i>Potentilla sanguisorba</i> ssp. <i>sanguisorba</i>	salad burnet	
<i>Potentilla sterilis</i>	barren strawberry	
<i>Primula veris</i>	cowslip	
<i>Primula vulgaris</i>	Primrose	
<i>Pulicaria dysenterica</i>	common fleabane	
<i>Ranunculus auricomus</i>	goldilocks buttercup	
<i>Ranunculus bulbosus</i>	bulbous buttercup	
<i>Ranunculus sardous</i>	hairy buttercup	
<i>Reseda lutea</i>	wild mignonette	
<i>Rhinanthus minor</i>	yellow-rattle	
<i>Rumex acetosella</i>	sheep's sorrel	
<i>Sanguisorba officinalis</i>	great burnet	
<i>Sanicula europaea</i>	sanicle	
<i>Saxifraga granulata</i>	meadow saxifrage	
<i>Scabiosa columbaria</i>	small scabious	
<i>Schedonorus pratensis</i>	meadow fescue	
<i>Scleranthus annuus</i>	annual knawel	
<i>Scorzonerooides autumnalis</i>	autumn hawkbit	
<i>Senecio erucifolius</i>	heath groundsel	
<i>Senecio viscosus</i>	sticky groundsel	
<i>Serratula tinctoria</i>	saw-wort	
<i>Sherardia arvensis</i>	field madder	
<i>Silaum silaus</i>	pepper-saxifrage	
<i>Silene dioica</i>	red campion	
<i>Silene flos-cuculi</i>	ragged-robin	
<i>Silene vulgaris</i>	bladder campion	
<i>Spergularia rubra</i>	sand spurrey	
<i>Stachys palustris</i>	marsh woundwort	

Scientific name	Common name	Comments
<i>Stellaria graminea</i>	lesser stitchwort	
<i>Stellaria holostea</i>	greater stitchwort	
<i>Succisa pratensis</i>	devil's-bit scabious	
<i>Teucrium scorodonia</i>	wood sage	
<i>Trifolium campestre</i>	hop trefoil	
<i>Trifolium medium</i>	zigzag clover	not the agricultural variety
<i>Valeriana officinalis</i>	common valerian	
<i>Veronica chamaedrys</i>	germander speedwell	
<i>Veronica officinalis</i>	heath speedwell	
<i>Veronica serpyllifolia</i>	thyme-leaved speedwell	
<i>Viola hirta</i>	hairy violet	
<i>Viola odorata</i>	sweet violet	
<i>Viola tricolor</i>	wild pansy	

Key: Species in bold score 2.

3.2 Woodland, scrub and hedgerows

3.2.1 Background

Woodlands under this section include all broadleaf semi-natural woodland and broadleaf and coniferous plantations on former ancient semi-natural woodland 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.

3.2.2 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 also be classified as ancient or recent. All ancient woodlands date back to medieval times or earlier, pre 1600 AD in England. In general, the majority of woodland that existed in 1600 is believed to have still been primary woodland, as little plantation had occurred before this date⁵.

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

⁵ Rackham, O. (1980). Ancient Woodland. London. Arnold.

conservation interest. It is now widely recognised that ancient woodlands support a suite of species that are confined to older sites. Ancient woodland is often categorised as Ancient Semi-Natural Woodland (ASNW) and Planted Ancient Woodland Sites (PAWS). The distinction is that the former has a canopy dominated by mixed broad-leaved species of varying ages, whereas PAWS have been clear felled and planted with a limited range of species. These may include native and non-native broad-leaved and coniferous species. PAWS are generally less species-rich than ASNW but often support important remnants of ancient woodland ground flora. In many cases both ASNW and PAWS can be found in the same stand of woodland.

The term semi-natural woodland refers to woodland comprising 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 Forestry Commission have recently produced a National Inventory of Woodlands and trees (July 2000) which lists the size, composition and condition of all the woodlands in the East Riding. There is also an Ancient Woodland Inventory for Humberside (EN, 1989), which covers approximately half of the East Riding area. This survey was conducted only in those areas of Humberside known to contain significant areas of Ancient Woodland. Sites of less than 2ha were excluded from the Inventory and as a consequence some small stands of ancient woodland in the area surveyed may have been omitted from the Inventory.

Woodland cover in the East Riding is sparse, well below the national average, and it does not feature as a major habitat in any particular Natural Area. However on a localised basis woodland communities are of great significance, such as the valley ash woodlands of the Yorkshire Wolds.

The Natural Area profile for Holderness states that there is just 83ha of ancient woodland in the NA, of which 68ha is semi-natural.

3.2.3 Wet woodlands

The UK HAP 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.

They occur largely as small pockets associated with flowing and standing waters, other wetlands and floodplain habitats, mainly in the Humberhead Levels and the Vale of York NAs, and to a lesser extent in Holderness which has very little woodland cover. A good example occurs at Low Wood next to Hornsea Mere in Holderness.

3.2.4 Mixed Ash woodlands of neutral to calcareous soils

The mixed ash woodlands of the East Riding correspond to the W8 (*Fraxinus excelsior* - *Acer campestre* - *Mercurialis perennis* woodland) community, which is found in the Yorkshire Wolds, Holderness and Vale of York and Mowbray NAs.

3.2.5 Oak woodlands of neutral to acidic soils

The W10 *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* woodland community occurs in the Vale of York, Holderness and the Humberhead Levels NAs.

3.2.6 Beech woodlands of neutral to calcareous soils

Beech woodland is not normally regarded as native in the north of England, but Eva Crackles gives some evidence to the contrary in the Flora of the East Riding of Yorkshire. Brough was called 'Petuaria' meaning beech grove by the Romans, though the possibility that it was introduced cannot be excluded.

3.2.7 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 scrub can be the climax vegetation community. More often scrub is seen as a threat to other semi-natural habitats 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 value in its own right, for example, species-rich scrub on chalk 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 LWSs allows for the inclusion of stands of scrub associated with these broad habitat types.

3.2.8 Hedgerows

The most comprehensive work on the distribution of species rich hedgerows was by Derek Boatman (2001)⁶. This report concentrated on the woody species present and did not attempt to record other plants or animals. Helen Kitchen

⁶ Boatman D.J. (2001). The composition and distribution of mixed hedges in East Yorkshire, The Naturalist, no 1038, vol 126, July-September 2001, p113-125.

(1998)⁷ found that between 1976/77 and 1998 there was a 13.6% reduction in the length of hedgerows in eleven 1km squares in Holderness. This decline is unlikely to be linear over time, as agricultural intensification and infrastructure developments are set against conservation measures like agri-environment grant schemes and the Hedgerow Regulations (1997).

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 habitats 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.

3.2.9 Selection Criteria and Attributes

Table 6 below sets out selection criteria and attributes for the designation of woodland LWS in the East Riding of Yorkshire.

Table 6: Selection criteria and attributes for woodland LWSs.

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 and 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 NVC types. Presence of significant populations of rare species
Representativeness	Presence of habitat and/or species characteristic of county or NA
Position in an ecological unit	Proximity to other sites or position in wildlife corridor.

⁷ Kitchen H.C. (1998). An investigation into the condition of hedgerows, as the landscape infrastructure of Holderness. MSc dissertation, Land Resource Management, Cranfield University.

Criterion	Attribute
Recorded history	Presence of historic documentation and cartographic evidence of ancient woodland or continuity of semi-natural woodland cover.

3.2.10 Woodland Selection Guidelines

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

Wd1

Areas of recognised ancient woodland habitat.

Application

This guideline is to be applied to woodland sites that meet the definition of ancient woodland as defined in the Ancient Woodland Inventory for Humberside. This includes both Ancient Semi-Natural Woodland (ASNW) and Planted Ancient Woodland (PAWS), as both types are sometimes found within the same wood. These are sites that are believed to have had continuous woodland cover since at least 1600. This should be supported by historical mapping evidence, and/or the survival of ancient features such as banks and ditches. This guideline is not restricted to sites listed within the Ancient Woodland Inventory of Humberside, as the inventory adopted a minimum threshold of 2ha in size.

Rationale

Ancient Woodland sites are those where there has been woodland cover for many hundreds, or even thousands of years. The ecological continuity of these woodlands gives them a highly valuable community which may take millennia to replace if lost. A key attribute of ancient woodlands is their soil structure and biota including fungi. These soils have not been subject to ploughing or general disturbance and consequently are distinct from the soils of many other habitats. These soils and their associated flora and fauna often survive in Planted Ancient Woodlands.

Ancient semi-natural woodlands have not been untouched. They have a history of various forms of management, often for timber or firewood and sometimes grazing. These practices have usually affected the structure and species composition of the woodlands today. The East Riding has a very low level of woodland cover and ancient semi-natural woodlands are rare. Therefore there is no size threshold given, as is the case for the Ancient Woodland Inventory, as smaller examples are still valuable in a local context.

Wd2

Stands of semi-natural woodland that are assigned to NVC community W8
Fraxinus excelsior – Acer campestre – Mercurialis perennis.

Application

This guideline will be applied to stands of semi-natural ash woodland. The definition of the site boundary will be a recognisable management unit, usually using contours or woodland coups as the NVC community stands may lie within larger woodlands. Sites should show a good affinity with W8 as determined by the surveyor and the LWS Panel. This guideline should not be used to designate sites where recently colonised, poor quality W8 is developing, except where these form part of larger W8 complexes or semi-natural woodland habitat networks.

Rationale

These woodland vegetation communities represent types of vegetation that are uncommon and fragmented in the East Riding. The W8 community is particularly characteristic of the Yorkshire Wolds.

Wd3

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

- a) **For an acidic woodland a score of 8 or more derived from the species listed in Table 8.**
- b) **For a neutral to calcareous woodland a score of 12 or more derived from the species listed in Table 7.**
- c) **For a wet woodland a score of 10 or more derived from the species listed in Table 9.**

Application

This guideline will be applied to all areas of woodland not listed as semi-natural ancient woodland in the Ancient Woodland Inventory (as those sites would be designated under guideline Wd1). The guideline may be applied to woodlands which are semi-natural or plantations (broad-leaved and mixed) or a combination of these.

Rationale

Much ancient woodland has been felled and replanted with coniferous and broad-leaved plantations, which can include both native and non-native species. These woodlands can continue to support features of ancient woodlands, such as species-rich rides with remnants of the ancient woodland ground flora. This remaining interest and the potential for restoration to a more semi-natural state cannot be replaced once lost and should be protected from adverse land-use change, such as development or agricultural conversion or intensification. These woodlands are considered an important part of the woodland nature conservation resource in the East Riding.

Wd4

Woodlands that have a ground flora of characteristic forbs which cover at least 25% of the woodland.

Application

This guideline is to be applied to woodlands which do not meet W3 because of a lack of species richness, but do have extensive cover of woodland ground flora. The qualifying species of flora are those listed in Tables 7 and WWW. The 25% coverage of ancient woodland species applies only to forbs in these tables and does not include trees, shrubs, grasses, sedges, rushes and ferns. In practice these are likely to be species which typically occur in extensive carpets such as bluebell, wood anemone and ramsons. This guideline applies only to naturally occurring populations and not to sites where woodland flowers have been planted.

Rationale

These woodlands with extensive areas of characteristic species may be of ancient origin. The woodland ground flora feature is of significant interest due to its extent rather than species richness. Woodlands which meet this guideline are therefore of significant ecological interest in an East Riding context.

Wd5

Semi-natural woodlands that adjoin or lie within 500m of an existing SSSI or LWS and have a score from Tables 7, 8 or 9 within 20% of the threshold for the other woodland guidelines.

Application

This guideline can be applied to any woodland site that does not meet any of the other woodland guidelines, but has a reasonable degree of species-riches and contributes to local habitat networks.

Rationale

The role and importance of habitat connectivity has been well studied, in relation to population dynamics and rates of extinction, immigration and emigration of individuals from one habitat patch to another. The value of habitats patches as stepping stones is recognised in the EU 'Habitats' Directive (92/43/EEC). This guideline enables woodlands to be designated, which although they are below the threshold for species richness, may make an important contribution to habitat networks within an area. These networks may include hedgerows, mixed habitats and other features which contribute to the ecological diversity and connectivity of the area.

Wd6

A hedgerow that is at least 30 metres in length, originates from the pre Enclosure Acts landscapes and meets one or more of the following criteria:

- a) an average of 6 or more species of native tree and/or shrub per 30m stretch
- b) an average of 5 or more species of native tree and/or shrub and a score of 5 or more for non-woody species listed in tables 7, 8 or 9 per 30m section.
- c) supports one or more veteran tree
- d) is a remnant of an ancient woodland

Application

This guideline can only be applied to hedgerows that are thought to originate from pre-Enclosure Acts landscape. In the East Riding the Enclosure Acts were generally in the late eighteenth and early nineteenth century. Determination of the origins of a hedge can be based on map evidence and, if no mapping evidence is available, from field evidence that indicates the hedgerow is ancient. Guidance is given in the Hedgerow Regulations 1997 on relevant documents that can be used to determine pre-Enclosure Acts hedgerows.

Rationale

Hedgerows originating from pre-Enclosure Acts landscapes are considered as ancient hedgerows by the UK HAP for Hedgerows. They are likely to support a good diversity of plant and animal species and are long established habitats in the landscape.

Wd7

A hedgerow or hedgerow that connects woodland LWS that are within 500m of each other and support 5 or more mature native broad-leaved trees and score 4 or more for non-woody species listed in tables 7, 8 or 9.

Application

This guideline can be applied to any hedgerow whether pre-Enclosure Acts or not. The hedgerows should be more or less continuous and there should be no gaps greater than 10m. If there is a series of gaps each less than 10m but accounting collectively for more than 30% of the length of the hedgerow, it should not be designated.

Rationale

Hedgerows are recognised as important habitats in their own right for a range of plant and animal species and also linear habitats that aid the dispersal of species. Hedges that connect woodland of Local Wildlife Site quality are likely to be more important for the dispersal of species.

Wd8

Scrub communities which contain 3 or more of the following species:

Spindle *Euonymus europaeus*
 Wild privet *Ligustrum vulgare*
 Purging buckthorn *Rhamnus cathartica*
 Dogwood *Cornus sanguinea*
 Burnet rose *Rosa spinosissima*
 Wild clematis *Clematis vitalba*
 Wild Service tree *Sorbus torminalis*
 Alder buckthorn *Frangula alnus*

Application

This guideline can be applied to areas of scrub that are more species rich. Two of the qualifying species should be at least occasional rather than rare on the site, when assessing their abundance using the DAFOR scale.

Rationale

Scrub can be a valuable community in its own right and the presence of these species indicates a more species-rich community.

Table 7: Vascular indicator plants of neutral to calcareous woodlands in the East Riding.

Scientific name	Common name	Comments
<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>Arum maculatum</i>	lords and ladies	
<i>Asplenium scolopendrium</i>	hart's tongue fern	
<i>Athyrium filix-femina</i>	lady fern	
<i>Atropa belladonna</i>	deadly nightshade	
<i>Bromopsis ramosa</i>	hairy-brome	
<i>Campanula trachelium</i>	nettle-leaved bellflower	
<i>Carex pallescens</i>	pale sedge	
<i>Carex pendula</i>	pendulous sedge	
<i>Carex remota</i>	remote sedge	
<i>Carex sylvatica</i>	wood sedge	
<i>Cephalanthera damasonium</i>	white helleborine	
<i>Chrysosplenium alternifolium</i>	alternate-leaved golden saxifrage	
<i>Chrysosplenium oppositifolium</i>	opposite-leaved golden saxifrage	
<i>Circaea lutetiana</i>	enchanter's-nightshade	
<i>Convallaria majalis</i>	lily of the valley	not planted
<i>Cornus sanguinea</i>	dogwood	not planted

Scientific name	Common name	Comments
<i>Daphne laureola</i>	spurge-laurel	
<i>Dryopteris carthusiana</i>	narrow buckler-fern	
<i>Dryopteris dilatata</i>	broad buckler-fern	
<i>Elymus caninus</i>	bearded couch	
<i>Epipactis phyllanthes</i>	green-flowered helleborine	
<i>Euonymus europaeus</i>	spindle	not planted
<i>Frangula alnus</i>	alder buckthorn	
<i>Galium odoratum</i>	sweet woodruff	
<i>Hyacinthoides non-scripta</i>	bluebell	Not Spanish, or hybrids
<i>Hypopitys monotropa</i>	yellow bird's-nest	
<i>Lathraea squamaria</i>	toothwort	
<i>Ligustrum vulgare</i>	wild privet	
<i>Luzula pilosa</i>	hairy wood-rush	
<i>Luzula sylvatica</i>	great wood-rush	
<i>Lysimachia nemorum</i>	yellow pimpernel	
<i>Melica uniflora</i>	wood melick	
<i>Mercurialis perennis</i>	dog's mercury	
<i>Milium effusum</i>	wood millet	
<i>Moebria trinervia</i>	three-nerved sandwort	
<i>Orchis mascula</i>	early-purple orchid	
<i>Oxalis acetosella</i>	wood sorrel	
<i>Paris quadrifolia</i>	herb paris	
<i>Platanthera chlorantha</i>	greater butterfly orchid	
<i>Polystichum aculeatum</i>	hard shield fern	
<i>Polystichum setiferum</i>	soft shield fern	
<i>Potentilla sterilis</i>	barren strawberry	
<i>Primula vulgaris</i>	primrose	
<i>Pyrola minor</i>	common wintergreen	
<i>Ranunculus auricomus</i>	goldilocks buttercup	
<i>Rhamnus cathartica</i>	buckthorn	
<i>Sanicula europaea</i>	sanicle	
<i>Schedonorus giganteus</i>	giant fescue	
<i>Tilia cordata (ancient)</i>	small-leaved lime	not planted
<i>Veronica montana</i>	wood speedwell	
<i>Viburnum opulus</i>	guelder rose	
<i>Vicia sylvatica</i>	wood vetch	
<i>Viola reichenbachiana</i>	early dog violet	

Key: Species in **bold** score 2.

Table 8: Vascular indicator plants of acid woodland in the East Riding.

Scientific name	Common name	Comments
<i>Anemone nemorosa</i>	wood anemone	
<i>Athyrium filix-femina</i>	lady fern	
<i>Blechnum spicant</i>	hard fern	
<i>Calluna vulgaris</i>	heather	
<i>Carex sylvatica</i>	wood sedge	
<i>Ceratocarpus claviculata</i>	climbing corydalis	

Scientific name	Common name	Comments
<i>Chrysosplenium oppositifolium</i>	opposite-leaved golden saxifrage	
<i>Circaea lutetiana</i>	enchanter's nightshade	
<i>Convallaria majalis</i> +	lily-of-the-valley	not planted
<i>Corylus avellana</i>	hazel	
<i>Deschampsia flexuosa</i>	wavy hair-grass	
<i>Dryopteris dilatata</i>	broad buckler-fern	
<i>Erica tetralix</i>	cross-leaved heath	
<i>Eriophorum angustifolium</i>	common cottongrass	
<i>Frangula alnus</i>	alder buckthorn	
<i>Hyacinthoides non-scripta</i> +	bluebell	Not Spanish, or hybrids
<i>Lonicera perichyenum</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>Moebria trinervia</i>	three-nerved sandwort	
<i>Oreopteris limbosperma</i>	lemon scented fern	
<i>Oxalis acetosella</i>	wood sorrel	
<i>Polypodium vulgare</i>	common polypody	
<i>Polytrichum spp.</i>	polytrichum mosses	
<i>Pyrola minor</i>	common wintergreen	
<i>Quercus petraea</i>	sessile oak	
<i>Salix aurita</i>	eared willow	
<i>Scrophularia nodosa</i>	common figwort	
<i>Sphagnum spp</i>	sphagnum mosses	
<i>Teucrium scorodonia</i>	wood sage	
<i>Vaccinium myrtillus</i>	bilberry	
<i>Viburnum opulus</i>	guelder rose	
<i>Viola palustris</i>	marsh violet	

Key: Species in **bold** score 2.

Table 9: Vascular indicator plants of wet woodlands in East Riding.

Scientific name	Common name	Comments
<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	

Scientific name	Common name	Comments
<i>Cardamine amara</i>	large bittercress	
<i>Carex acuta</i>	slender tufted sedge	
<i>Carex acutiformis</i>	lesser pond sedge	
<i>Carex laevigata</i>	smooth-stalked sedge	
<i>Carex nigra</i>	common sedge	
<i>Carex paniculata</i>	greater tussock 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 carthusiana</i>	narrow buckler fern	
<i>Equisetum fluviatile</i>	water horsetail	
<i>Equisetum telmateia</i>	giant horsetail	
<i>Erica tetralix</i>	cross-leaved heath	
<i>Frangula alnus</i>	alder buckthorn	
<i>Geum rivale</i>	water avens	
<i>Hydrocotyle vulgaris</i>	marsh pennywort	
<i>Iris pseudacorus</i>	yellow iris	
<i>Lamium strumarium</i>	yellow archangel	(<i>spp. montanum</i>)
<i>Lysimachia nemorum</i>	creeping jenny	
<i>Mercurialis perennis</i>	dog's mercury	
<i>Myosotis scorpioides</i>	water forget-me-not	
<i>Oxalis acetosella</i>	wood sorrel	
<i>Paris quadrifolia</i>	herb paris	
<i>Phragmites australis</i>	common reed	
<i>Poa nemoralis</i>	wood meadow-grass	
<i>Primula vulgaris</i>	primrose	
<i>Ranunculus flammula</i>	lesser spearwort	
<i>Salix cinerea</i> ssp. <i>Oleifolia</i>	grey willow	
<i>Scutellaria galericulata</i>	skullcap	
<i>Scirpus sylvaticus</i>	wood club-rush	
<i>Silene flos-cuculi</i>	ragged robin	
<i>Sphagnum</i> spp.	sphagnum mosses	
<i>Stellaria alsine</i>	bog stitchwort	
<i>Stellaria neglecta</i>	great chickweed	
<i>Stellaria nemorum</i>	wood stitchwort	
<i>Valeriana dioica</i>	marsh valerian	
<i>Valeriana officinalis</i>	common valerian	
<i>Viburnum opulus</i>	guelder rose	not planted
<i>Viola palustris</i>	marsh violet	

Key: Species in bold score 2.

3.3 Parkland, wood pasture and traditional orchards

3.3.1 Background

There is little information on the distribution of parkland wood pasture and ancient trees in the East Riding. However small pockets of 18th Century parkland associated with period country houses are found within the Vale of York NA.

Parklands and wood pasture habitats are the product of historic land management systems, and represent a vegetation structure rather than being a particular plant community (UK BAP). 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 permanent pasture or heathland. In some circumstances, the parkland or wood pasture may also include ornamental or natural standing water bodies and flowing water habitats.

3.3.2 Parkland

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.

3.3.3 Wood Pasture

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, invertebrates associated with deadwood, bats and birds.

3.3.4 Veteran Trees

Great Britain probably holds a high proportion of veteran trees in Europe and therefore all veteran trees are important for nature conservation.⁸ 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

⁸ David Clayden, English Nature *pers.comm.*

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 produced a book regarding all aspects of veteran trees and their management.⁹ 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 that 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 guide is an essential aid in the determination of veteran and old trees. Age alone is not a sufficient criterion.

3.3.5 Traditional Orchards

Traditional Orchards have a similar habitat structure to parkland and wood pasture. The key characteristic is that they are dominated by relatively widely spaced mature fruit trees set in grazed or un-grazed grassland. Traditional orchards differ from modern commercial orchards in that the trees are medium to large specimens rather than the ‘bush’ varieties in modern orchards. Many trees in traditional orchards are old and support dead wood habitat. Many traditional orchards have lost most of their trees and now have only scattered trees remaining. The grasslands in traditional orchards may be of some ecological value as they have often not been subject to the same intensification of management as other permanent grasslands.

3.3.6 Selection Criteria and Attributes

Table 10 below sets out selection criteria and attributes for the designation of parkland, wood pasture and traditional orchard LWS in the East Riding of Yorkshire.

Table 10: Selection criteria and attributes for parkland, wood pasture and traditional orchard LWS.

Criterion	Attribute
Size	Area of site (ha)
Rarity	Presence of rare saproxylic fungi ¹⁰ Presence of saproxylic invertebrates found which are listed in the Index of Ecological Continuity. ^{11 12 13}

⁹Helen Read (2000). Veteran Trees - A guide to good management. English Nature.

¹⁰ Ted Green. Index in prep.

¹¹ 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.

¹² Harding, PT and Alexander, KNA. (1993) The Saproxylic Invertebrates of Historic Parklands: Progress and Problems. In: xxx (eds) Kirby and Drake (1993).

¹³ Harding, PT and 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

Criterion	Attribute
	Presence of lichens found listed in the Revised Index of Ecological Continuity ^{14 15}
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 and 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 and wood pasture Presence of habitat and/or species characteristic of the county or NA.
Position in an ecological unit	Proximity of site to other LWSs 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.

3.3.7 Parkland, Wood Pasture and Traditional Orchard Selection Guidelines

Sites will be eligible for selection as an LWS if they meet any of the following guidelines.

<p>Pk1</p> <p>Parkland or Wood Pasture with at least 1 mature tree per ha that meets any of the following criteria:</p> <ul style="list-style-type: none"> a) Supports at least 2 veteran trees b) Supports significant dead wood habitat c) Supports fungi, lower plants or fauna associated with parkland and dead wood habitats which are important in a local context d) Supports extensive areas of unimproved or semi-improved grassland
--

Application

History, 7 (Suppl), pp21-26.

¹⁴ Rose, F. (1976). Lichenological indicators of age and environmental continuity in woodlands. In (eds) Brown, DH, Hawksworth, DL and Bailey, RH. (1976) Lichenology: progress and problems. pp279-307. London, Academic Press.

¹⁵ Harding and Rose 1986. Pasture woodlands in lowland Britain. Huntingdon, Institute of Terrestrial Ecology.

This guideline should be applied to Parkland or Wood Pasture sites which have features of ecological interest. The relevant features are defined below:

- a.) – Veteran trees should be recorded using recognised methodologies. The features of the trees which are considered to be significant in classifying them as veteran trees must be clearly identified.
- b.) – Significant dead wood habitat cannot be measured precisely, but should include dead wood on several trees. It may include dead limbs or parts of limbs, dead wood with the trunk and fallen dead wood as this can be a valuable habitat for fungi and invertebrates.
- c.) – Records of fungi lower plants such as lichens and mosses or dead wood fauna such as invertebrates should be within the last five years. Species should ideally include UK BAP species or nationally scarce or notable invertebrates which are dependant on dead wood.
- d.) – Semi-natural grassland includes grassland showing an affinity to the following NVC communities: neutral grassland - MG4, MG5, MG6 (more species-rich examples); calcareous grassland - CG2, CG3, CG4, CG5, CG7; acid grassland – U1, U4.
- e.) – Other habitats and features may include water bodies, water courses, flushes, marshy grassland, heathland, or species rich hedgerows.

Rationale

Parkland and Wood Pasture are the products of historic management systems, and represent a vegetation structure rather than a particular vegetation community. The ecological importance of such sites is often related to mature or veteran trees but can also include other species and habitats. The potential features of interest may well vary between different sites. Therefore this guideline uses a suite of features of ecological interest.

Pk2 (Vt1)

Veteran Trees

Any site that supports three or more veteran trees.

Application

This guideline should be applied to groups of veteran trees which occur in a definable management unit, such as a woodland, field or hedgerow. Veteran trees should be recorded using recognised methodologies. The features of the trees which are considered to be significant in classifying them as veteran trees must be clearly identified.

Rationale

Veteran trees can support a range of fungi, flora and fauna due to their diversity of micro habitats that develop with the ageing process. In general groups of veteran trees are more valuable than single veteran trees, as they provide a greater aggregation of micro habitats and are greater ecological continuity of the habitats. Veteran trees are rare in the East Riding due to the low levels of woodland cover. Therefore all groups of veteran trees are of conservation importance.

Pk3 (Or1)

Any site supporting traditional orchard habitat as defined by the UK BAP containing at least 12 trees.

Application

This guideline should normally be applied to orchards meeting the threshold in traditional medium to large sized trees, rather than dwarf or bush specimens, although these may also be present. The threshold applies to living trees, but may include trees nearing the end of their life, as they can support dead wood habitat which may have additional biodiversity value.

Rationale

Traditional orchards are a very rare habitat in the East Riding and one that has declined considerably during the last century. Traditional orchards may also support grasslands of ecological interest as they have often not been subject to the same intensification of management as other permanent grasslands.

3.4 Fens, lowland mires, springs and flushes

3.4.1 Background

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 usually have a higher water table for longer during the year than fen habitats. As such they tend to be dominated by Reeds such as *Phragmites* whereas fens tend to have a more diverse range of herbaceous species. Swamp and fen often occur in complex habitat mosaics due to subtle variations in topography and hydrology. Fen habitats are often understood to imply impeded ground of a less acidic/neutral and more calcareous nature and soil structure. 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 referred to, and managed as grasslands, but technically have been classified as mire communities. As such they are covered by these selection guidelines.

Fens and lowland acid mires are characterised by a summer water table at or just below the sediment surface but which increases periodically, leading to flooding or water-logging 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 surface water, ground water, rainfall and the soil and 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 monodominant 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 of 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'. Similarly the terms 'fen' and 'mire' are often viewed as interchangeable by some writers and in some works, depending on the degree of acidity or alkalinity exhibited by the habitat concerned. So we can also come across Topogenous and Soligenous mires.

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.

3.4.2 Poor-fens and lowland acid mires

Poor-fens and lowland acid mires occur on geological formations such as sandstone 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. Where rainfall is high and frequent, such as in parts of the Humberhead Levels, lowland raised bog may form. This habitat derives all of its water requirements from rainfall and the vegetation is isolated from the influences of surface or groundwater. Lowland raised bog is a priority habitat under the UK BAP.

3.4.3 Rich-fens and calcareous springs/flushes

Rich-fens are generally irrigated with base-rich waters and are predominantly lowland in distribution. A typical example would be the chalk spring fed fen at North Newbald Becksies. These 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 HAP for fens, which excludes other habitats, such as reedbed, which are covered by other national HAPs. The plan for fens does not provide any detailed information on the cover or distribution of fens. There is also a UK HAP for purple moor grass and rush pastures which includes some of the lowland acid mire communities included in these selection guidelines.

A variety of fen and mire types occur in the East Riding ranging from wet heath and purple moorgrass communities of damp acidic soils in the Vale of York NA to eutrophic tall herb fens associated with wetlands throughout the County.

3.4.4 Selection Criteria and Attributes

Table 11 below sets out selection criteria and attributes for the designation of fen, lowland acid mire and spring and flush LWS in the East Riding of Yorkshire.

Table 11: Selection criteria and attributes for fen, lowland acid mire and spring and flush LWSs.

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 East 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
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.
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.
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 turbarry, and

Criterion	Attribute
	sites with a palynological record.
Fragility	Vulnerability of sites to eutrophication, agricultural improvement, drainage or unchecked successional change.

3.4.5 Fens, lowland mires, springs and flushes Selection Guidelines

Sites will be eligible for selection as an LWS if they meet any of the following guidelines.

Fe1

Areas of lowland mire habitat that support the following NVC community types:

- M22 *Juncus subnodulosus-Cirsium palustre* fen-meadow
- M23 *Juncus effusus/acutiflorus-Galium palustre* rush pasture
- M24 *Cirsio-Molinientum caeruleae* fen-meadow

Application

This guideline will be applied to areas of fen meadow and rush pasture that show a good affinity with the NVC communities listed above. The classification of the community should be based on the judgement of the surveyors and the LWS Panel.

Rationale

In the East Riding these vegetation communities and the assemblage of plants and animals they support have become rare.

Fe2

Stands of tall-herb fen and/or reedbed that are predominately comprised of the following NVC communities:

- S4 *Phragmites australis* swamp and reed-beds
- S25 *Phragmites australis-Eupatorium cannabinum* swamp and reed-beds
- S26 *Phragmites australis-Urtica dioica* tall-herb fen
- S27 *Carex rostrata- Potentilla palustris* tall-herb fen
- S28 *Phalaris arundinacea* tall-herb fen
- M27 *Filipendula ulmaria-Angelica sylvestris* mire

Application

This guideline will be applied to areas dominated by tall-herb fen that show a good affinity with the NVC communities listed above. The classification of the community should be based on the judgement of the surveyors and the LWS panel. These NVC communities may occur in mosaics with other wetland habitats, in which case the area designated should be based on management or mapping units. This guideline does not apply to agricultural drainage ditches which are subject to regular maintenance by the drainage authorities.

Rationale

Tall-herb fens in the East Riding have been greatly reduced to drainage and agricultural improvement. However, re-wetting of some sites has enabled the development of new communities in some areas. Examples of these NVC communities are still very scarce or localised in the East Riding and therefore an important habitat type.

Fe3

Areas of rich-fen habitat that score 10 or more from the species listed in Table 12.

Application

This guideline may be applied to any fen site, whether of an identified NVC community or not, so long as it includes a representative selection of species listed in Table 12. These species are characteristic of species-rich good quality rich-fen types.

Rationale

Rich-fen sites have been adversely affected by agricultural and other land-use changes in the East riding. The remaining sites are often small and isolated from other similar habitats. 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.

Fe4

Areas of poor-fen and acid mire habitat that score 8 or more from the species listed in Table 13.

Application

This guideline may be applied to any fen site, whether of an identified NVC community or not, so long as it includes a representative selection of species listed in Table 13. These species are characteristic of good quality poor-fen types.

Rationale

Poor-fen sites are rare within the East Riding and support specialised groups of plants associated with this habitat.

Fe5

Areas of mixed fen and mire habitat that score 10 or more from the combined species listed in Tables 12 and 13

Application

This guideline should be applied to fen and/or lowland acid mire complexes that cannot readily be distinguished as rich or poor fen or lowland mire and do not qualify under of the other guidelines.

Rationale

These 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 that reflect complex variations in topography, substrate and hydrology.

Fe6

Springs and associated flushes that score 6 or more from the species listed in Table 14

Application

This guideline should be applied to habitats associated with springs and flushes.

Rationale

Springs and their associated flushes often occur in combination with grassland, 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 reliant upon the hydrology and water quality of the local bedrock.

Table 12. Plant species characteristic of rich-fens.

Scientific name	Common name	Comments
<i>Achillea ptarmica</i>	sneezewort	
<i>Anagallis tenella</i>	bog pimpernel	
<i>Angelica sylvestris</i>	angelica	
<i>Athyrium filix-femina</i>	lady fern	
<i>Berula erecta</i>	lesser water-parsnip	
<i>Blysmus compressus</i>	flat sedge	
<i>Calamagrostis canescens</i>	purple small-reed	
<i>Calliergon spp.</i>	calliergon mosses	
<i>Caltha palustris</i>	marsh marigold	
<i>Carex spp.</i>	sedges	All species
<i>Cirsium dissectum</i>	meadow thistle	
<i>Cladium mariscus</i>	saw sedge	
<i>Comarum palustre</i>	marsh cinquefoil	
<i>Crepis paludosa</i>	marsh hawk's-beard	
<i>Dactylorhiza spp. (except</i>	marsh orchids	All species
<i>D. fuchsii</i>		
<i>Dryopteris carthusiana</i>	narrow buckler-fern	
<i>Eleocharis spp. (except</i>	spike-rushes	
<i>E. palustris</i>		
<i>Epipactis palustris</i>	marsh helleborine	
<i>Equisetum fluviatile</i>	water horsetail	
<i>Equisetum telemataeia</i>	giant horsetail	
<i>Eriophorum angustifolium</i>	common cottongrass	
<i>Eriophorum vaginatum</i>	hare's-tail cottongrass	
<i>Eupatoria cannabinum</i>	hemp agrimony	
<i>Filipendula ulmaria</i>	meadowsweet	
<i>Galeopsis bifida</i>	bifid hemp-nettle	
<i>Galium uliginosum</i>	fen bedstraw	
<i>Geum rivale</i>	water avens	
<i>Gymnadenia densiflora</i>	marsh fragrant orchid	
<i>Hydrocotyle vulgaris</i>	marsh pennywort	
<i>Hypericum tetrapterum</i>	square-stalked St. John's-wort	
<i>Iris pseudacorus</i>	yellow flag	
<i>Juncus compressus</i>	round-fruited rush	
<i>Juncus subnodulosus</i>	blunt-flowered rush	
<i>Lathyrus palustris</i>	marsh pea	
<i>Lotus pedunculatus</i>	greater birdsfoot trefoil	
<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	
<i>Neottia ovata</i>	common twayblade	
<i>Oenanthe fistulosa</i>	tubular water dropwort	

Scientific name	Common name	Comments
<i>Oenanthe lachenalii</i>	parsley water-dropwort	
<i>Parnassia palustris</i>	grass-of-Parnassus	
<i>Pedicularis palustris</i>	marsh lousewort	
<i>Pedicularis sylvatica</i>	lousewort	
<i>Phragmites australis</i>	common reed	
<i>Pinguicula vulgaris</i>	butterwort	
<i>Pulicaria dysenterica</i>	fleabane	
<i>Ranunculus flammula</i>	lesser spearwort	
<i>Ranunculus lingua</i>	greater spearwort	
<i>Salix pentandra</i>	bay willow	
<i>Samolus valerandi</i>	brookweed	
<i>Sanguisorba officinalis</i>	great burnet	
<i>Schoenus nigricans</i>	black bog rush	
<i>Scirpus sylvaticus</i>	wood club-rush	
<i>Scutellaria galericulata</i>	skullcap	
<i>Serratula tinctoria</i>	saw-wort	
<i>Silene flos-cuculi</i>	ragged robin	
<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>Typha angustifolia</i>	Lesser bulrush	
<i>Utricularia spp</i>	bladderwort	All species
<i>Valeriana dioica</i>	marsh valerian	
<i>Valeriana officinalis</i>	common valerian	
<i>Veronica scutellata</i>	marsh speedwell	
<i>Viola palustris</i>	marsh violet	

Key: Species in bold score 2.

Table 13: Plant species characteristic of poor fens and acid mires.

Scientific name	Common name	Comments
<i>Agrostis canina</i>	velvet bent	
<i>Anagallis tenella</i>	bog pimpernel	
<i>Calluna vulgaris</i>	heather	
<i>Carex spp.</i>	sedges	all species
<i>Comarum palustre</i>	marsh cinquefoil	
<i>Dactylorhiza spp.</i>	marsh orchids	all species except <i>D. fuchsii</i>
<i>Danthonia decumbens</i>	heath-grass	
<i>Drosera spp.</i>	sundew spp.	
<i>Epilobium palustre</i>	marsh willowherb	
<i>Erica tetralix</i>	cross-leaved heath	
<i>Eriophorum spp.</i>	cotton-grasses	all species
<i>Galium palustre</i>	marsh bedstraw	
<i>Gentiana pneumonanthe</i>	marsh gentian	
<i>Hydrocotyle vulgaris</i>	marsh pennywort	
<i>Hypericum elodes</i>	marsh St John's-wort	
<i>Isolepis setacea</i>	bristle club rush	
<i>Juncus acutiflorus</i>	sharp-flowered rush	

Scientific name	Common name	Comments
<i>Juncus squarrosus</i>	heath rush	
<i>Menyanthes trifoliata</i>	bogbean	
<i>Molinia caerulea</i>	purple moor-grass	
<i>Montia fontana</i>	blinks	
<i>Nardus stricta</i>	mat-grass	
<i>Pedicularis palustris</i>	marsh lousewort	
<i>Pedicularis sylvatica</i>	common lousewort	
<i>Ranunculus flammula</i>	lesser spearwort	
<i>Salix aurita</i>	eared willow	
<i>Salix repens</i>	creeping willow	
<i>Scutellaria galericulata</i>	skullcap	
<i>Scutellaria minor</i>	lesser skullcap	
<i>Sphagnum spp.</i>	bog moss	
<i>Stellaria alsine</i>	bog stichwort	
<i>Succisa pratensis</i>	devil's-bit scabious	
<i>Trichophorum germanicum</i>	deer grass	
<i>Utricularia spp.</i>	bladderwort	all species
<i>Viola palustris</i>	marsh violet	

Key: Species in bold score 2.

Table 14: Plant species characteristic of calcareous springs and associated flushes.

Scientific name	Common name	Comments
<i>Blysmus compressus</i>	flat sedge	
<i>Caltha palustris</i>	marsh marigold	
<i>Cardamine pratensis</i>	cuckoo flower	
<i>Carex echinata</i>	star sedge	
<i>Carex demissa</i>	common yellow sedge	
<i>Carex flacca</i>	glaucous sedge	
<i>Carex hostiana</i>	tawny sedge	
<i>Carex panicea</i>	carnation sedge	
<i>Carex pulicaris</i>	flea sedge	
<i>Carex lepidocarpa</i>	long-stalked yellow sedge	
<i>Catabrosa aquatica</i>	water whorl-grass	
<i>Chrysosplenium alternifolium</i>	alternate-leaved golden saxifrage	
<i>Chrysosplenium oppositifolium</i>	opposite-leaved golden saxifrage	
<i>Cirsium palustre</i>	marsh thistle	
<i>Dactylorhiza spp</i>	marsh orchids	
<i>Eleocharis quinqueflora</i>	few-flowered spike-rush	
<i>Epilobium palustre</i>	marsh willowherb	
<i>Epipactis palustris</i>	marsh helleborine	
<i>Equisetum telmateia</i>	great horsetail	
<i>Hydrocotyle vulgare</i>	marsh pen	
<i>Juncus compressus</i>	round-fruited rush	

Scientific name	Common name	Comments
<i>Montia fontana</i>	Blinks	
<i>Pedicularis palustris</i>	marsh lousewort	
<i>Pinguicula vulgaris</i>	butterwort	
<i>Sagina nodosa</i>	knotted pearlwort	
<i>Stellaria palustris</i>	marsh stitchwort	
<i>Valeriana dioica</i>	marsh valerian	
<i>Cratoneuron commutatum</i>	moss	
<i>Cratoneuron filicinum</i>	moss	
<i>Philonotis fontana</i>	moss	
<i>Calliergon spp</i>	moss	
<i>Drepanocladus spp</i>	moss	
<i>Ctenidium molluscum</i>	moss	
<i>Brachythecium rivulare</i>	moss	

Key: Species in **bold** score 2.

3.5 Standing Water Habitats

3.5.1 Background

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, emergent and marginal/wet mud 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 drainage 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.

3.5.2 Eutrophic standing water

According to the UK HAP, 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 waters is thought to be in the region of 1785km². In England it is estimated that 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, some of which can be potentially toxic (blue-green algae).

Eutrophic waters can support a high biodiversity, including planktonic algae and zooplankton, as well as submerged, floating, emergent 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.

3.5.3 Mesotrophic standing water

According to the UK HAP, 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 stoneworts (*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 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.

In the East Riding 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.

The East Riding standing water habitats include natural lakes such as the “meres” in the Holderness NA, which are a series of peat filled depressions left by the retreating ice from the last glacial period. The best known example is Hornsea Mere SSSI which is, at around 120ha in size, the largest natural lake in Yorkshire.

There is quite a long list of man made standing water features, which are also of high nature conservation importance. These range from the dewponds of the Yorkshire Wolds NA to the Leven and Pocklington Canals in the Holderness and Vale of York NAs respectively, both of which have notable SSSI sections. Other important man made features include: mill ponds; monastic ponds; stock watering ponds; and mineral extraction sites, both former sand and gravel workings and clay and borrow pits (delphs). The latter are particularly significant in the Howden/Walling Fen area. The locally extensive networks of wet agricultural ditches have variable significance both as wildlife corridors and as habitats in their own right.

3.5.4 Selection Criteria and Attributes

Table 15 below sets out selection criteria and attributes for the designation of standing water LWS in the East Riding of Yorkshire.

Table 15: Selection criteria and attributes for standing water LWSs.

Criterion	Attribute
Size	The area of a site or, for canals and ditches, 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. 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 the East Riding. Examples include white-clawed crayfish and greater water parsnip.
Representativeness	The use of trophic status/nutrient level data, Conductivity, pH, hardness data where available. Presence of meres in Holderness NA or dewponds on Yorkshire Wolds NA. The presence of aquatic NVC communities. (NVC data will be used where it is available, as aquatic vegetation is under-recorded in the East Riding).
Position in an ecological unit	The proximity to and connections with other wetlands or habitats necessary for the survival of other biotic groups (invertebrates and amphibians), including non-designated sites or designated sites. Site in key migration route for wildlife. Buffer zone function
Fragility	Point source or diffuse source pollution does not adversely affect the site.

3.5.5 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 may also be included within the LWS if they warrant designation in their own right. If they do not merit designation they may also be included within the standing water LWS 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 LWS. Linear sites such as canals should be assessed in sections between readily identifiable features such as bridges or locks, or for ditches this may include confluences or junction points.

3.5.6 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 an LWS.

Sw1

A nutrient rich standing water that scores 10 or more from the species listed in Table 16 with at least one species recorded from two of the following habitat zones:

**Submerged
Floating
Emergent**

Application

The majority of the species recorded in Table 16 should be well distributed throughout the site. If they are rare the site should not be designated.

Rationale

The species listed in table 16 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.

Sw2

A nutrient poor standing water that scores 5 or more from the species listed in Table 17

Application

The majority of the species recorded in Table 17 should be well distributed throughout the site. If they are rare the site should not be designated.

Rationale

The species listed in table 17 provide an indication of good examples of nutrient poor standing water habitat (mesotrophic, oligotrophic through to dystrophic).

Sw3

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

- a) mesotrophic standing water
- b) 5 or more submerged aquatic species from tables 16 and 17
- c) stable charophyte communities
- d) maritime brackish water ponds

Application

This guideline should be applied to those key habitats that are known to be rare within the county. Under a) mesotrophic standing water is defined in earlier text. Under b) this is not intended to be applied to pioneer communities dominated by *Chara* in the process of succession to macrophyte communities, or to ditches dredged within the last two years. Any assessment should look at historical data for stoneworts at the site to demonstrate that they exist in a sustainable community.

Rationale

The above are rare habitats or vegetation community types in the East Riding.

Sw4

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

- a) The presence of 2 or more species in Table 18, one of which must be one of the specialist species marked with an asterisk.

or

- 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, fen or reservoirs.

Rationale

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

Table 16: Indicative species list for nutrient rich standing waters (eutrophic through to mesotrophic).

Scientific name	Common name	Characteristic Species
<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>Calliergon spp.</i>	calliergon mosses	
<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	

Scientific name	Common name	Characteristic Species
<i>Ceratophyllum demersum</i>	rigid hornwort	
Charophytes	any stonewort	*
Cladium mariscus	great fen sedge	*
<i>Drepanocladus aduncus</i>	a moss	
Eleocharis acicularis	needle spike-rush	
Eleogiton fluitans	floating club-rush	*
<i>Equisetum fluviatile</i>	water horsetail	
<i>Groenlandia densa</i>	opposite-leaved pondweed	
<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	
Hottonia palustris	water violet	*
Hydrocharis morsus-ranae	frogbit	*
<i>Hydrocotyle vulgaris</i>	marsh penny wort	
<i>Iris pseudacorus</i>	yellow flag	
Spirodela polyrhiza	greater duckweed	
<i>Lythrum salicaria</i>	purple loosestrife	
<i>Mentha aquatica</i>	water mint	
Menyanthes trifoliata	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	
Myriophyllum alterniflorum	alternate water milfoil	*
<i>Myriophyllum spicatum</i>	spiked water milfoil	
Myriophyllum verticillatum	whorled water-milfoil	
<i>Nasturtium officinale</i>	water-cress	
Nitella spp.	any stonewort	
<i>Nuphar lutea</i>	yellow water-lily	when not introduced
<i>Nymphaea alba</i>	white water-lily	when not introduced
<i>Oenanthe aquatica</i>	fine leaved water dropwort	
<i>Oenanthe crocata</i>	hemlock water dropwort	
<i>Oenanthe fistulosa</i>	tubular water-dropwort	
Oenanthe lachenalii	parsley water-dropwort	
<i>Persicaria amphibia</i>	amphibious bistort	
<i>Phragmites australis</i>	common reed	
Pilularia globulifera	pillwort	*
Potamogeton alpinus	red pondweed	*
<i>Potamogeton berchtoldii</i>	small pondweed	
Potamogeton coloratus	fen pondweed	*
<i>Potamogeton crispus</i>	curled pondweed	
<i>Potamogeton friesii</i>	flat-stalked pondweed	
<i>Potamogeton natans</i>	broad-leaved pondweed	
<i>Potamogeton pectinatus</i>	fennel-leaved pondweed	

Scientific name	Common name	Characteristic Species
<i>Potamogeton pusillus</i>	lesser pondweed	
<i>Ranunculus spp (aquatic)</i>	water-crowfoot species	
<i>Riccia/ Ricciocarpus spp.</i>	liverworts	
<i>Sagittaria sagittifolia</i>	arrowhead	
<i>Schoenoplectus lacustris</i>	common club-rush	
<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>Tolypella spp.</i>	any stonewort	2 points each
<i>Typha angustifolia</i>	lesser bulrush	
<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	

Key: Species in **bold** score 2.

Table 17: Indicative species list for nutrient poor standing waters (dystrophic, oligotrophic through to mesotrophic).

Scientific name	Common name	Characteristic Species
<i>Apium inundatum</i>	lesser marshwort	
<i>Baldellia ranunculoides</i>	lesser water-plantain	*
<i>Callitriche hamulata</i>	intermediate water-starwort	
<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>Comarum palustre</i>	marsh cinquefoil	
<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>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 natans</i>	broad-leaved pondweed	
<i>Potamogeton perfoliatus</i>	bog pondweed	
<i>Ranunculus flammula</i>	lesser spearwort	
<i>Ranunculus spp. (aquatic)</i>	water crowfoot species	
<i>Schoenoplectus tabernaemontani</i>	grey club-rush	
<i>Sphagnum spp.</i>	bog moss	
<i>Utricularia spp.</i>	Bladderwort (any species)	*

Key: Species in bold score 2.

Table 18: Indicative species list for draw-down zones and open vegetation of inundation habitat.

Scientific name	Common name	Specialist species
<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>Comarum palustre</i>	marsh cinquefoil	
<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>Lythrum portula</i>	water purslane	*
<i>Myosotis spp.</i>	water forget-me-nots	
<i>Persicaria amphibia</i>	amphibious bistort	
<i>Persicaria minor</i>	small water-pepper	*
<i>Pilularia globulifera</i>	pillwort	*
<i>Persicaria hydropiper</i>	water-pepper	
<i>Potentilla anserina</i>	silverweed	
<i>Ranunculus repens</i>	creeping buttercup	
<i>Rorippa spp.</i>	the smaller yellow-cress species	
<i>Rumex maritimus</i>	golden dock	*
<i>Rumex palustris</i>	marsh dock	
<i>Veronica scutellata</i>	marsh speedwell	

Key: Species in **bold** score 2.

3.6 Flowing Water Habitats

3.6.1 Background

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, however pools and marshy areas associated with rivers floodplains may be included within a river LWS site. Canals are included under the standing water section as their plant communities are more characteristic of standing than flowing water systems. Ditches may be designated under flowing water guidelines where their flora has closer affinities with those of flowing waters, but both flowing and standing water guidelines should be applied to see which is more suitable. Species strongly associated with flowing water habitats, such as water vole and otter are included in selection guidelines for species groups.

The Water Framework Directive is a European Community Directive which came into force in December 2000 and was enacted into UK Law in December 2003. It requires ground waters, surface waters and estuaries to reach minimum standards for water quality. It is therefore an important driver for the improvement of water quality. The Environment Agency is the lead authority in England for the implementation of the Directive.

3.6.2 Rivers

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.¹⁶ 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 bank side 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.

¹⁶ 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 can result in a shift from submerged vegetation dominated by macrophytes to communities dominated by algae.

The East Riding supports a diverse range of flowing water in the form of streams and rivers. The River Hull headwaters form the most northerly chalk stream in the UK. They are particularly important for supporting river water-dropwort *Oenanthe fluvialis* at the northern limit of its range in the UK. There are also seasonal winterbournes such as the Gypsy Race which dry up or have very reduced flows in the summer.

The lower reaches of the large lowland rivers, the Humber, Ouse, Hull and Derwent have all been heavily modified by flood defence banks, barrages (Hull and Barmby) and weirs (Naburn). Some of the lower reaches are classified as 'high-level carriers' by the flood defence authorities which means they are isolated from their flood plains and washlands are not practical as they would require pumped drainage. They act as important migratory routes for birds and fish.

3.6.3 Land and Level Drains

A number of large land or 'level' drains such as the Barmston, Winestead, Keyingham and Hedon drains also cross the Holderness Plain and, although heavily canalised, they form important refuges and corridors for wildlife, such as water voles. Goulder (2000)¹⁷ describes and evaluates the botanical value of some of the Holderness drains.

3.6.4 Selection Criteria and Attributes

Table 19 below sets out selection criteria and attributes for the designation of flowing water LWS in the East Riding of Yorkshire.

Table 19: Selection criteria and attributes for flowing water LWSs.

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).

¹⁷ Goulder R. (2000). Aquatic macrophytes and conservation in the drains of the Hull Valley, The Naturalist, Number 1032, Vol. 125, January-March 2000, pp17-28.

Criterion	Attribute
	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 the East Riding. '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 and 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.

3.6.5 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 BAP:

“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 LWS boundaries, as defined by physical features on the ground e.g. bridges or field boundaries.

In the long term, the assessment of rivers of LWS 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 LWSs on that basis and therefore boundaries will be determined as specified in the previous paragraph.

3.6.6 Flowing Water Selection Guidelines

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

Fw1

A stretch of river or smaller water course that supports three or more of the following features:

Islands

Shingle banks and shoals

River cliffs (earth or rock)

Riffle and run systems

Sand or mud banks

Vegetated or un-vegetated point bars

Diverse channel-edge and bank-side vegetation structure

Unmodified bank profiles

Significant water-crowfoot beds

Adjacent flood plain wetland habitats

Application

The guideline should be applied to stretches of rivers that include the relevant features. The boundary should be demarcated by clearly definable features such as bridges, weirs, or other structures or obvious changes in river form such as canalisation. The landward boundary should include bank-side vegetation and adjacent flood plain wetland habitats where these are qualifying features. These may include ox-bows, ponds, swamps and small areas of wet woodland. Evidence of the relevant features should be mapped with target notes.

Rationale

Most rivers and smaller water courses in the East Riding have been modified to some degree including canalisation, flood bank construction and periodic channel re-profiling and dredging. These modifications have often had an adverse impact upon ecological interest due to the reduction in habitat niches. Therefore stretches of rivers that retain some features of a more semi-natural structure provide a better habitat for aquatic flora and fauna such as fish and invertebrates.

Fw2

A stretch of river or smaller water course that scores 12 or more from the species listed in Table 20.

Application

This guideline should be applied to sites meeting the threshold score. The boundary should be demarcated by clearly definable features such, such as bridges, weirs, or other structures, or obvious changes in river form such as canalisation.

Rationale

These rivers support a good diversity of aquatic plants and are therefore of conservation importance.

Fw3

Any stream that originates in the calcareous substrata of the Yorkshire Wolds Natural Area and supports 4 or more species of characteristic calcareous stream flora listed in Table 20

Application

This guideline should be applied to streams which support a characteristic calcareous flora meeting the threshold. The downstream extent to the designation should be the limit of the aquatic vegetation type. This guideline may be supported by additional information regarding associated invertebrate assemblages, but such evidence is not essential.

Rationale

Chalk streams originating in the Yorkshire Wolds NA are a distinctive and rare habitat in the County. This guideline identifies good quality examples which exhibit a characteristic aquatic flora. Unmodified near natural watercourses, 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. Certain stretches of the Wolds calcareous streams exhibit chalk stream characteristics which is a UK Biodiversity Action Plan habitat.

Fw4

Any drain in the Holderness, Humber Estuary, Humberhead Levels or Vale of York Natural Areas, that supports 10 or more species listed in Table 20

Application

This guideline should be applied to drains which support an aquatic flora meeting the threshold. The extent to the designation should reflect the extent of the interest and be clearly definable, e.g. demarcated by bridges, culverts, or obvious bends. The designation should take account of the cyclical nature of management of drains. As a result of this management the distribution of flora may vary between sections and years. Therefore the records from a series of years may be considered to aid determination of boundaries.

Rationale

Drains in these NAs often support remnants of a flora that was once much more widespread before extensive drainage took place. The extensive arable landscapes in these natural areas have limited amounts of semi-natural habitats. Therefore these drains provide an important extensive linear semi-natural habitat which can act as a means of dispersal for many plants and animals.

Drains are slow flowing water habitats which left unmanaged would be subject to vegetation succession. This process would lead to drains being colonised by swamp vegetation and eventually willow dominated wet woodland. The cyclical management of clearing out drains is therefore essential both for the water management function and to maintain open water habitat for aquatic flora and fauna.

Table 20: Flowing water vascular plants.

Scientific name	Common name	Calcareous stream species
<i>Alisma lanceolatum</i>	narrow-leaved water plantain	
<i>Alisma plantago-aquatica</i>	water plantain	
<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 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>Hippuris vulgaris</i>	mare's-tail	

Scientific name	Common name	Calcareous stream species
<i>Hottonia palustris</i>	water violet	
<i>Juncus subnodulosus</i>	blunt-flowered rush	
<i>Lemna trisulca</i>	ivy-leaved duckweed	
<i>Lythrum salicaria</i>	purple loosestrife	
<i>Mentha aquatica</i>	water mint	
<i>Myosotis scorpioides</i>	water 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>Nasturtium officinale</i>	water-cress	
<i>Nuphar lutea</i>	yellow water lily	
<i>Nymphaea alba</i>	white water lily	
<i>Oenanthe fluviatilis</i>	river water dropwort	
<i>Potamogeton berchtoldii</i>	small pondweed	
<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>Potamogeton pusillus</i>	lesser pondweed	
<i>Ranunculus fluitans</i>	river water crowfoot	*
<i>Ranunculus penicillatus ssp. pseudofluitans</i>	stream water-crowfoot	*
<i>Ranunculus spp.</i> (aquatic)	other water-crowfoot species	*
<i>Rorippa amphibia</i>	great yellow-cress	
<i>Rumex hydrolapathum</i>	water dock	
<i>Sagittaria sagittifolia</i>	arrowhead	
<i>Samolus valerandi</i>	common club-rush	
<i>Schoenoplectus tabernaemontani</i>	grey club-rush	
<i>Sparganium emersum</i>	unbranched bur-reed	
<i>Veronica anagallis-aquatica</i>	blue water speedwell	*
<i>Veronica beccabunga</i>	brooklime	
<i>Zannichellia palustris</i>	horned pondweed	

Key: Species in bold score 2.

3.7 Coastal and Estuarine Habitats

3.7.1 Background

In the East Riding habitats associated with the coast and Humber estuary include maritime cliff and slope, saltmarsh, sand dune, vegetated and unvegetated shingle, saline lagoon and mudflat, sea grass beds. These habitats all occur within the Humber Estuary NA, Saltburn to Bridlington MA and the Bridlington-Skegness MA.

The Humber Estuary is the only estuarine system within the East Riding, which supports a mosaic of mudflats, saltmarsh, vegetated and unvegetated shingle and saline lagoons. The estuary is designated as a SSSI, SAC and SPA. The bird interest is in part due to vast numbers of wintering waders and wildfowl, but it also supports important concentrations of breeding little terns and bearded tits. Designated habitats include estuary, coastal lagoon, Atlantic salt meadow, salicornia annual communities, mud and sand flats and sand banks. Sea and river lampreys are also of European significance.

3.7.2 Maritime Cliff and Slope

Maritime cliffs and slopes are defined as sloping to vertical faces on the coastline where a break in slope is formed by slippage and/or coastal erosion. The landward limit of the zone is determined by the limit of salt spray. The type of cliff and slope that is formed is influenced by a variety of factors including the nature of the underlying bedrock and superficial deposits. These habitats, especially the grasslands, heaths and scrub, can be considered as some of the most natural habitats remaining in the UK.

The UK HAP 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 the East Riding this resource is comprised of 54 km of soft cliff in the Bridlington to Skegness Maritime Natural Area and 6.5 km of hard cliff comprised of chalk in the Saltburn to Bridlington Maritime Natural Area¹⁸.

The chalk cliffs around Flamborough Head are the most northerly chalk sea cliffs in the England and as such are designated as Sites of Special Scientific Interest (SSSI) and SAC. The only section of the soft cliff which is designated as a SSSI is at Dimlington Cliff, a nationally important example of Quaternary stratigraphy, at the southern end of the Bridlington to Skegness Maritime Natural Area. The soft cliffs are extremely dynamic and are some of the fastest eroding cliffs in the UK. As a consequence they largely support ruderal vegetation adapted to frequent disturbance rather than the characteristic salt tolerant species associated with maritime cliff and slope.

3.7.3 Coastal Sand dunes

Coastal sand dunes are rare in the East Riding and are largely restricted to the Humber Estuary and the southern tip within the county of the Bridlington to Skegness Maritime Natural Area at Easington and Spurn. These are part of the Humber Estuary SSSI/SPA. There are also very small dune systems on low-lying reaches of the Holderness coast.

3.7.4 Saline Lagoons

Saline lagoons are located close to the sea where they are subject to sea spray and in some situations influxes of sea water. Some are natural water bodies and others have arisen as a result of the excavation of borrow pits or clay pits. The

¹⁸ Selman, R., F. Dodd and K. Bayes (1999) A Biodiversity Audit of Yorkshire and the Humber. Yorkshire and Humber Biodiversity Forum.

lagoons at Easington (North and South) and Blacktoft Sands are designated as a SSSIs and part of the Humber Estuary SPA.

3.7.5 Coastal vegetated shingle

Coastal vegetated shingle is a rare habitat in the East Riding and is restricted to Spurn Point. As well as supporting a characteristic variety of plant species this habitat provides valuable nesting sites for little ringed plover and little tern. All these areas are within SSSIs.

3.7.6 Saltmarsh

Saltmarsh within the East Riding of Yorkshire is almost entirely restricted to the Humber Estuary. It supports a characteristic range of specialist plants which tolerate varying levels of salt water inundation during tidal cycles.

3.7.7 Mudflats and sea-grass beds

Mudflats and sea grass beds are restricted to the Humber Estuary forming an internationally important habitat mosaic with other estuarine habitats such as saltmarsh. These habitats support internationally important numbers of wintering birds and valuable assemblages of invertebrates and plants.

3.7.8 Selection Criteria and Attributes

Table 21 below sets out selection criteria and attributes for the designation of coastal habitat LWS in the East Riding of Yorkshire.

Table 21: Selection criteria and attributes for coastal habitat LWSs.

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 East Riding and the region, particularly estuary and chalk cliff.
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 and 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.

3.7.9 Coastal and Estuarine Habitat Selection Guidelines

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

C&E1

Areas of semi-natural habitat in coastal and estuarine environments which support good examples of the following habitats:

Intertidal mudflats and sea grass beds
Brackish fens and swamp
Saltmarsh
Coastal sand dunes
Saline Lagoons
Vegetated shingle

Application

This guideline should be applied to any sites that support good examples of these coastal habitats. Good examples are defined as those which support a typical range of species characteristic of the habitat. The habitat patch should also be of sufficient size to justify designation. Managed realignment sites created adjacent to statutory sites may be designated until such a time as they may be included with the statutory site in future. Small brackish ponds, which may be seasonal or have varying water levels, should be considered under the standing water guidelines and not as saline lagoons. The boundaries of sites should not extend below mean low water.

Rationale

These habitats are all characteristic and often rare or localised features of the East Riding's coastal and estuarine environment. They support a range of specialised species and therefore are of significant conservation interest.

3.8 Mixed Habitat and Structural Mosaics

3.8.1 Background

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 that are valuable for invertebrate groups. These sites can make an important contribution to the local biodiversity value of an area.

Semi-natural habitat mosaic sites can occur on abandoned or less intensively managed agricultural or industrial land. In the latter case the mosaic will often comprise habitats that are 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 faunal species, 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 is important to their survival. Structural heterogeneity can be considered on different scales.¹⁹ The more complex the vegetation structure, the greater the niche diversity and therefore, the greater the number of insects likely to be present.²⁰

Structural complexity is generally a function of vegetation architecture, although it may also refer to substrate architecture. This could 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 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.

¹⁹ Hammond, M. (2000). The importance of habitat structure in assessing site quality for nature conservation. Unpub paper prepared for North Yorkshire LWS Panel.

²⁰ Speight, MR, Hunter MD and Watt, AD. (1999). Ecology of insects: concepts and applications. Blackwell Science Oxford.

3.8.2 Habitat Mosaic Selection Guidelines

Any site that meets one of the following guidelines will be eligible for LWS designation.

Mh1

Sites that support a combination of two or more individual habitats that are within 20% of the qualifying criteria / thresholds for each habitat.

Application

This guideline should be applied to any sites that supports a mosaic of semi-natural vegetation. At least two of the habitats must be within 20% of qualifying under other habitat guidelines. The site may however include other habitats that are not within 20% if they form part of the same mapping/management unit. This guideline should also be applied to any verge or linear habitat site that supports a varied habitat structure in a 'vergescape'. Examples of mixed habitats in verges commonly include grassland, hedgerows and ditches, but may also include scrub and various wetland habitats. Verges that have significant semi-natural grassland interest should be assessed under the appropriate grassland guideline. The guideline can be applied to verges that occur adjacent to roads, railways (used or disused), cuttings and embankments, tracks, green lanes, towpaths, footpaths or bridleways.

Rationale

Typically, mixed habitat sites will support different stages in vegetation succession. The transition zones between these habitats can also provide a valuable ecotone. This may benefit some species which need a combination of different habitats types within close proximity to support their lifecycles. Verges are valuable as linear habitat corridors linking other sites within the wider landscape, increasing connectivity and allowing movement of species between other sites. This is especially important given the potential effects of climate change upon the distribution of species.

Mh2

Sites that support a mosaic of the semi-natural habitats listed in Table 22 that collectively have a habitat diversity score greater than 6 and make a significant contribution to the local biodiversity value of the NA in which they are situated.

Application

This guideline should be applied to any site that supports a combination of habitats. The assessment of the contribution to the local biodiversity value should be based on the importance of the UK BAP habitats and species present on the site.

Rationale

The combination of different habitat types in close proximity to each other can help support a wide range of plant and animal species. 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 semi-natural habitats of LWS quality.

Mh3

Sites that support features indicating high structural diversity within habitat types as shown in Table 23 and make a significant contribution to the local biodiversity value of the NA in which they are situated.

Application

This guideline should be applied to any site that supports a varied habitat structure. The assessment of the contribution to the local biodiversity value should be based on the importance of the UK BAP habitats and species present on the site.

Rationale

A high degree of structural diversity with habitats provides many niches and micro habitats which can support a high diversity of animal species, especially invertebrates.

Table 22: Habitat mosaics.

Habitat	Score
Unimproved neutral grassland (MG5, MG4, MG8, MG9, MG10)	4 points
Unimproved calcareous grassland (CG9, CG10)	4 points
Unimproved lowland dry acid grassland	4 points
Ancient semi-natural woodland	4 points
Wet heath or bog	4 points
Chalk scree	4 points
Dry heath	3 points
Tall coarse grassland and scattered scrub mosaic	2 points
Scrub communities of more than 1 woody 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

Table 23: Features of structural diversity.

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 and hoofprints (with continuity over several years)	

4. Guidelines for the Selection of Local Wildlife Sites – Species Guidelines

4.1 Species Guidelines Background

In the East Riding Local Sites System there is a general presumption in favour of assessing sites on the basis of habitat guidelines. Candidate Sites should therefore be screened firstly against the habitat guidelines before the species guidelines are considered.

Many sites which qualify under the Habitats guidelines will also have individual species or assemblages which qualify under the species guidelines. If a site has already qualified under the habitat guidelines it is still useful to identify any species guidelines that the site may also qualify under. This may be particularly relevant when considering the impacts of any planning application or changes in management to a designated Local Wildlife Site (LWS).

The approach taken to selecting sites for species is based on either individual rare species or assemblages of species. National lists are used in most cases to identify individual species of conservation importance. For taxa where knowledge of the distribution and status is good, additional species may be identified. The assessment of assemblages is often based on a simple number of indicator species. However, where knowledge is sufficient, a scoring system, or other more refined methods may be used.

Assemblage guidelines have not been developed for all species groups, as knowledge on some taxa is too limited and no robust assemblages are known for these. However, if it can be demonstrated that robust assemblage species lists are available and the necessary data and local expertise can be identified then the designation of LWS for species assemblages can be considered for other groups over and above those listed in these guidelines.

Many species receive varying degrees of protection under European and UK legislation, The Conservation of Habitats and Species Regulations 2010 (which implements the EU ‘Habitats Directive’) and the Wildlife and Countryside Act 1981 (as amended), are the key pieces of legislation.

The LWS guidelines do not seek to duplicate the protection afforded by such legislation. However the guidelines do refer to some schedules in the legislation to identify rare species for LWS designation. LWS designation in general aims to identify and protect the habitat that supports the life cycle of a species, not just its breeding site, which is generally the focus of the legislation. LWS designation is therefore only appropriate for species which are supported by a relatively discreet area of habitat, not for wide ranging species such as birds of prey, bats or otters.

4.2 Application of the Species Guidelines

The guidelines use national lists of conservation for all invertebrates plus assemblages and rare breeding species for better recorded groups, for example birds. The application of national lists such as the UK BAP and Red Data Books

should be applied to the most recent version of the lists concerned. In the case of Red Data Books this may be for a large group of taxa or for smaller subgroups. In the case of Red Data Books, these should only be used to designate sites for species which are genuinely rare in the East Riding.

Currently in the East Riding the knowledge of the distribution of many groups of species is very limited. Therefore when considering designation, regard should be had to the level of data available for the species and its possibility that the species is under-recorded in the East Riding. For lesser known taxa designation should only be made in consultation with the relevant County recorders or other acknowledged experts for that particular species group.

Unfortunately there are cases where unauthorised introductions of species occur. Only naturally occurring populations should be considered for designation (except for certain authorised species recovery programmes). If the occurrence of a species on a site is known or suspected to be the result of introduced or escaped stock it should not be considered as a feature for designation.

4.3 Vascular Plants

4.3.1 Background

Vascular plants include flowering plants (angiosperms) and ferns (pteridophytes). Assemblages of vascular plants have been used to assess different habitats in the Habitats section of the Guidelines. Therefore species guideline VP1 for vascular plants only considers species that are rare or considered to be of conservation importance.

4.3.2 Application of the Vascular Plant Guidelines

The guidelines should only be applied to populations of species which are of natural occurrence and native to the East Riding. It is important to determine the distribution of the plants in the locality, examining other potential sites, in order to determine a suitable site boundary. Sites where there has been a recent deliberate introduction or re-introduction (excluding certain species recovery programmes) should not be selected.

4.3.3 Vascular Plant Selection Guidelines

VP1

Any site that supports a population of a plant species which is native to the East Riding of Yorkshire and meets any one of the following criteria:

1. Fully protected under Schedule 8 of the Wildlife and Countryside Act (as amended);
2. Listed in the Red Data Book Categories 'Critically Endangered', 'Near Threatened' or 'Vulnerable';
3. Listed as a Priority species in the UK Biodiversity Action Plan; or
4. Listed as being a species of 'principal importance for the conservation of biological diversity' in the Natural Environment and Rural Communities Act (NERC).

Application

This guideline should be applied with regard to the most current version of each of the respective lists. 'Fully protected under schedule 8 of the Wildlife & Countryside Act' refers to protection under section 13 Part 1(a) and excludes those species protected in respect of sale only by Parts 2(a&b) e.g. Bluebell.

Rationale

All of the species on these lists have been identified as rare or threatened and in need of conservation at a national level. Therefore any local populations should be identified, conserved and where possible enhanced as they are important for sustaining biological diversity throughout the British Isles.

4.4 Non-Vascular Plants

4.4.1 Background

Non-vascular plants include mosses, liverworts, lichens and stoneworts. Identification of most taxa is very difficult and usually requires microscopic identification. There are very few expert recorders of these taxa and therefore knowledge of their local distribution and status is far less complete than for vascular plants. It is important therefore that records of all rare species are confirmed by recognised experts, including recorders for county, regional or national recording schemes.

Many species are restricted to specific micro habitats and therefore populations may be confined to small areas of a single tree, rock surface, building or bare ground, while stoneworts are aquatic species. It is therefore important to determine the distribution of the plants in the locality, examining other potential sites, in order to determine a suitable site boundary.

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

4.4.2 Non-Vascular Plant Selection Guidelines

NV1

Any site that supports a population of a non-vascular plant species which is native to the East Riding of Yorkshire and meets any one of the following criteria:

- 1. Fully protected under Schedule 8 of the Wildlife and Countryside Act (as amended);**
- 2. Listed in the Red Data Book Categories ‘Critically Endangered’, ‘Near Threatened’ or ‘Vulnerable’;**
- 3. Listed as a Priority species in the UK Biodiversity Action Plan; or**
- 4. Listed as being a species of ‘principal importance for the conservation of biological diversity’ in the Natural Environment and Rural Communities Act (NERC).**

Application

This guideline should be applied with regard to the most current version of each of the respective lists, for the relevant taxonomic group. ‘Fully protected under schedule 8 of the Wildlife & Countryside Act’ refers to protection under section 13 Part 1(a) and excludes those species protected in respect of sale only by Parts 2(a&b).

Rationale

All of the species on these lists have been identified as rare or threatened and in need of conservation at a national level. Therefore any local populations should be identified, conserved and where possible enhanced as they are important for sustaining biological diversity throughout the British Isles.

4.5 Fungi

4.5.1 Background

There are many thousands of species of fungi in Britain. They include mushrooms, toadstools, as well as rusts and moulds. Most Fungi are a mycelium, a fine, sinuous thread-like structure. In most species the mycelium produces fruiting bodies which are often only evident for short period. It is the fruiting bodies which are used for identification and therefore most taxa can only be identified for a short period of the year, generally in the autumn. The abundance and frequency of the production of fruiting bodies can vary greatly from year to year. As with non-vascular plants, identification often requires expert examination of microscopic characteristics. Many groups are therefore not well recorded in the East Riding. Designation should therefore take account of the current knowledge of species or communities in consultation with expert

recorders. Designation should only be applied to naturally occurring populations, not deliberate, or accidental introductions.

4.5.2 Fungi Selection Guidelines

Fu1

Any site that supports a population of a fungi species which is native to the East Riding of Yorkshire and meets one any of the following criteria:

- 1. Fully protected under Schedule 8 of the Wildlife and Countryside Act (as amended);**
- 2. Listed in the Red Data Book Categories ‘Critically Endangered’, ‘Near Threatened’ and ‘Vulnerable’;**
- 3. Listed as a Priority species in the UK Biodiversity Action Plan; or**
- 4. Listed as being a species of ‘principal importance for the conservation of biological diversity’ in the Natural Environment and Rural Communities Act (NERC).**

Application

This guideline should be applied with regard to the most current version of each of the respective lists. Records of rare species should be supported by photographs or microscopic examination where necessary. ‘Fully protected under schedule 8 of the Wildlife & Countryside Act’ refers to protection under section 13 Part 1(a) and excludes those species protected in respect of sale only by Parts 2(a&b).

Rationale

All of the species on these lists have been identified as rare or threatened and in need of conservation at a national level. Therefore any local populations should be identified and conserved and where possible enhanced as they are important for sustaining biological diversity throughout the British Isles.

Fu2

Any site that supports waxcaps *Hygrocybe spp.* which meets one of the following criteria:

1. An assemblage of 8 or more species from multiple visits;
2. An assemblage of 6 species from a single visit; or
3. A recent record of Crimson Waxcap (*Hygrocybe punicea*)

Application

This guideline should be applied to all the sites with recent records of waxcaps, *Hygrocybe spp.* Records of rare species should be supported by photographs or microscopic examination where necessary.

Rationale

The genus *Hygrocybe* are often colourful mushrooms of nutrient poor, short sward grasslands. They are generally easier to identify and therefore better studied than many other grassland fungi such as *Clavaria*, *Entoloma* and *Geoglossae* species. The fruiting bodies are usually only visible on certain days during autumn and not more than 75% of the species present on a site would be expected to be fruiting on any one date. The single species *H. punicea* is chosen as it is a very good indicator of species rich waxcap assemblages, and any site with this species would be expected to support an assemblage of at least 8 species

4.6 Mammals

4.6.1 Background

In keeping with the general principles of the species guidelines, the mammal guidelines have been restricted to scarcer species whose ranges can be encompassed within an LWS boundary. Consequently wide ranging species, including otters, brown hare, bats and water vole have not been included in the guidelines.

The presence of mammal species will be based on sightings, as well field signs such as, droppings and nest sites. These should be confirmed by someone with relevant expertise of appropriate survey techniques.

4.6.2 Mammals Selection Guidelines

M1

Any site that regularly supports a significant population of the following mammal species:

- Harvest Mouse; or
- Water Shrew.

Application

Sufficient data must be available to demonstrate a link between the species and continued occupation of a defined site for at least two years. Sites where species have been introduced should not normally be considered unless they are part of a recognised species recovery programme. Site boundaries should include likely key breeding and feeding areas, rather than the total area over which the species may be recorded.

Rationale

These mammals are scarce and localised in the East Riding. Harvest Mouse was traditionally associated with cornfields; however it occurs in a range of tall grass type habitats, including reedbeds, fen and ruderal. Water Shrew inhabits rivers and streams with clean, clear water. It feeds on aquatic and terrestrial invertebrates and so also utilises vegetation adjacent to watercourses. These species are therefore suitable for protection through a site based approach as they inhabit relatively discreet areas of habitat.

4.7 Birds

4.7.1 Background

Birds are generally a well recorded group and knowledge of the status of individual species in an East Riding context is good. However populations and breeding at individual sites may vary from year to year. Therefore when considering the designation of sites for birds it is important that recent evidence of breeding is available to support any designation.

4.7.2 Birds Selection Guidelines

B1

Any site that supports 0.5% of the UK breeding population of a bird.

Application

This guideline should be applied to sites where the average (5 year mean) breeding population meets the threshold, or where the population significantly exceeds the threshold for more than one year.

Rationale

The threshold for consideration for SSSI designation is 1% and therefore in keeping with many other Local Sites guidelines the LWS threshold is half that of the SSSI threshold.

B2

Any site that supports 0.5% of the UK wintering or migratory population of a bird.

Application

This guideline should be applied to sites where the average (5 year mean) wintering or migratory population meets the threshold.

Rationale

The threshold for consideration for SSSI designation is 1% and therefore in keeping with many other Local Sites guidelines the LWS threshold is half that of the SSSI threshold.

B3

Any site that supports a population of a rare breeding bird species in the East Riding. The species to which this guideline should be applied are listed in table 24 below

Table 24: Rare breeding bird species in the East Riding of Yorkshire.

Scientific Name	Common Name
<i>Anas querquedula</i>	Garganey
<i>Podiceps nigricollis</i>	Black-necked grebe
<i>Botaurus stellaris</i>	Bittern
<i>Egretta garzetta</i>	Little egret
<i>Porzana porzana</i>	Spotted crake
<i>Crex crex</i>	Corn crake
<i>Recurvirostra avocetta</i>	Avocet
<i>Philomachus pugnax</i>	Ruff
<i>Limosa limosa</i>	Black-tailed godwit
<i>Larus melanocephalus</i>	Mediterranean gull
<i>Sterna albifrons</i>	Little tern
<i>Streptopelia turtur</i>	Turtle dove
<i>Asio otus</i>	Long-eared owl
<i>Caprimulgus europaeus</i>	Nightjar
<i>Dendrocopus minor</i>	Lesser spotted woodpecker
<i>Lullula arborea</i>	Woodlark
<i>Anthus trivialis</i>	Tree pipit
<i>Saxicola rubetra</i>	Whinchat
<i>Cettia cetti</i>	Cetti's warbler
<i>Acrocephalus palustris</i>	Marsh warbler
<i>Panurus biarmicus</i>	Bearded tit
<i>Coccythraustes coccythraustes</i>	Hawfinch

Application

The guideline should be applied to any site supporting a population of a rare breeding bird in the East Riding. The status of some breeding species changes over time and the table should be periodically reviewed as necessary based on the best available data. Species may be added or removed during reviews depending on changes to their status. In general species should only be added where the population in the East Riding is less than 20 pairs, or the species is confined to less than 5 sites.

Rationale

These are rare breeding birds in the East Riding and all breeding sites should be protected.

B4

Any site that supports a nesting colony of the following species which reaches the population threshold (number of pairs) listed:

1. Grey heron (15 pairs);
2. Cormorant (5 pairs); or
3. Common tern (5 pairs).

Application

The population should be an average over 3 years, or double the threshold for a single year. In the case of Common tern the site should include the whole of the water-body in which they are breeding. In the case of Grey heron and Cormorant it should include the woodland, or other structure used for nesting, and adjacent water-bodies if they are important for feeding during the breeding season.

Rationale

These colonial breeding species are very localised as breeding birds in the East Riding and all breeding sites should be protected.

B5

Any site that supports a significant assemblage of breeding birds in the following habitats:

1. Wet grassland, scores 5 or more in table 25;
2. Open water and margins, scores 8 or more in table 26; or
3. Woodland, scores 5 or more table 27.

Table 25: Breeding birds of wet grassland

Scientific Name	Common Name	Score
<i>Vanellus vanellus</i>	Lapwing	1
<i>Gallinago gallinago</i>	Snipe	2
<i>Numenius arquata</i>	Curlew	2
<i>Tringa totanus</i>	Redshank	1
<i>Cuculus canorus</i>	Cuckoo	2
<i>Alauda arvensis</i>	Skylark	1
<i>Anthus pratensis</i>	Meadow Pipit	1
<i>Motacilla flava</i>	Yellow wagtail	2
<i>Locustella naevia</i>	Grasshopper warbler	2
<i>Emberiza schoeniclus</i>	Reed Bunting	1

Table 26: Breeding birds of open waters & margins

Scientific Name	Common Name	Score
-----------------	-------------	-------

<i>Tadorna tadorna</i>	Shelduck	1
<i>Anas strepera</i>	Gadwall	1
<i>Anas crecca</i>	Teal	2
<i>Anas clypeata</i>	Shoveler	2
<i>Aythya farina</i>	Pochard	1
<i>Aythya fuligula</i>	Tufted Duck	1
<i>Tachybaptus ruficollis</i>	Little Grebe	1
<i>Rallus aquaticus</i>	Water Rail	2
<i>Haemataopus ostralegus</i>	Oystercatcher	1
<i>Charadrius dubius</i>	Little ringed Plover	1
<i>Vanellus vanellus</i>	Lapwing	1
<i>Tringa totanus</i>	Redshank	1
<i>Chroicocephalus ridibundus</i>	Black-headed gull	1
<i>Sterna hirundo</i>	Common Tern	1
<i>Cuculus canorus</i>	Cuckoo	2
<i>Alcedo atthis</i>	Kingfisher	1
<i>Riparia riparia</i>	Sand Martin	1
<i>Motacilla flava</i>	Yellow wagtail	2
<i>Locutella naevia</i>	Grasshopper warbler	2
<i>Emberiza schoeniclus</i>	Reed Bunting	1

Table 27: Breeding birds of woodland

Scientific Name	Common Name	Score
<i>Scolopax rusticola</i>	Woodcock	2
<i>Picus viridis</i>	Green woodpecker	1
<i>Sylvia communis</i>	Whitethroat	1
<i>Phylloscopus trochilus</i>	Willow Warbler	1
<i>Muscicapa striata</i>	Spotted Flycatcher	2
<i>Poecile montana</i>	Willow Tit	2
<i>Poecile palustris</i>	Marsh Tit	1
<i>Sitta europaea</i>	Nuthatch	2
<i>Passer montanus</i>	Tree Sparrow	1
<i>Carduelis cannabina</i>	Linnet	1
<i>Pyrrhula pyrrhula</i>	Bullfinch	1

Application

Data should preferably be gathered in accordance with recognised national bird survey methodologies or adaptations of these for LWS bird surveys. The guideline will be applied using Table WWG, 26 & 27 with the species in this table having being collated from historic data, bird reports and via consultation with local recorders. The guidelines should be applied to the following habitats as follows:

- **Wet grassland.** This includes grassland / fen mosaics with a significant wet grassland component. Ditches may be an integral part of the site. Open water should be limited to shallow small or seasonal pools. Any more significant areas of open water should be considered under the ‘open water & margins guideline’.

- **Open water & margins.** This may include natural and man-made lakes and excavations, as well as marginal vegetation, such as swamp and reedbeds. Other margins may include islands and grassed areas utilised by breeding birds.
- **Woodland and scrub.** This includes all types of woodland and includes orchards, scrub and habitat mosaics with a significant woodland / scrub component.

Rationale

The assemblages of the species listed represent a significant interest for the relevant habitats in which they are recorded.

B6

Any wetland site that regularly supports significant populations of at least 10 species of overwintering water-birds of conservation concern.

Application

This guideline will be applied to sites that regularly support significant populations of at least 10 species of wintering waterbirds of conservation concern. Species of conservation concern include those listed under section 41 of the NERC Act, UK BAP species and those species listed on the Red and Amber categories of the most recent edition of 'Birds of conservation concern' published by the RSPB (currently 2009). Water-birds include wildfowl, divers, grebes, herons, rails and waders. Gulls are not included in this guideline. Sites should have monthly counts for at least three consecutive winters (November to February). Significant populations are considered to be an average monthly maxima of at least 200 birds for the combined list of species of conservation concern. At least 8 species of conservation concern should be recorded in each year with the combined monthly maxima averaging over 200 in at least two of the three years. Wetland sites include open water, swamp, fen and wet grassland. Sites may include patches of habitat which are not contiguous, if the birds regularly make use of sites in close proximity to one another.

Rationale

Due to its relatively mild winter climate, Britain is an important wintering ground for many water-birds which breed in Scandinavia, Eastern Europe and Russia. Many water bodies and other wetland habitats support valuable assemblages of these wintering birds. This guideline identifies sites which are important for a broad range of species, but which would not qualify for a large population of a single species under guideline B2. The guideline recognised that populations of wintering waterbirds fluctuate due to weather conditions and other factors. The guideline includes scope to designate multiple and non-contiguous areas of habitat, as water-birds will often move between sites within a discreet geographical area depending on food availability, disturbance, predation and roosting opportunities.

B7

Any coastal or wetland site that regularly supports a significant range of migrating birds.

Application

This guideline should be applied to sites which are regularly used by a significant range of birds on migration. The numbers and range of species using a site will vary from year to year, due to fluctuations in populations and weather patterns, which affect the numbers of species recorded. Sites must however be used regularly in spring and /or autumn with peak migration times being April/May and August to October inclusively. Sites must have recorded at least 50 species of migrating birds annually for a period of at least three consecutive years. Migrating birds may include all species which could be reasonably considered to be migrating through the site, even if some of these species may also occur as residents e.g. blackbird. This guideline should only be applied to discreet areas of habitat that support migrant birds. These may include woodland, scrub and wetlands in coastal locations. At inland locations wetlands are the key sites which attract a significant range of migrants. Other associated habitats may be included if they occur in a combined management unit, or form part of the overall value of the site for migrants. The guideline should not be applied to extensive areas of improved or semi-improved grasslands. In common with the general guideline principles it will not be applied to arable land or buildings. The guideline should only be applied to sites that support grounded migrant birds through the provision of food or cover, and not to birds flying over sites, often termed 'visible migration'.

Rationale

Many hundreds of thousands of birds migrate through the East Riding of Yorkshire every year. Many migrating birds come from continental Europe and Russia, either as winter visitors, or on passage to wintering grounds further south. Their first landfall after crossing the North Sea is the east coast of Yorkshire and many rest and feed in coastal woodlands and scrub. Wetland birds may concentrate at suitable resting and feeding sites further inland. Because the number of birds recorded on migration varies considerably from year to year it is not possible to specify quantitative thresholds for the number of individuals.

4.8 Reptiles

4.8.1 Background

All reptile species are localised in the East Riding. Grass snake is the most widely distributed, occurring mostly in lowland areas with extensive networks of watercourses. Adder is very rare and common lizard is very localised. Slow worm also appears to be very localised.

4.8.2 Reptiles Selection Guideline

R1

Any site that supports a breeding population of any native reptile species.

Application

This guideline should be applied only to sites with evidence of breeding, not any site with a record of a reptile species. This is particularly important in the case of Grass Snake which ranges widely, especially along water courses. Evidence of breeding should include records of eggs, young, multiple individuals in suitable breeding habitat, or records of different individuals over multiple years. Photographic evidence may be required in the latter case.

Rationale

Breeding populations of reptiles are very localised in the East Riding and therefore all are of importance. All species can be mobile to varying degrees and therefore the guideline seeks to identify breeding sites rather than sites where the species may be of casual occurrence.

4.9 Amphibians

4.9.1 Background

There are five native species of amphibians in the East Riding, all of which have declined over the last 50 years. Common frog, common toad and smooth newt are widely, although sometimes thinly distributed throughout the county. Great crested newt is more localised and palmate newt only occurs west of the Yorkshire Wolds, where it is scarce.

4.9.2 Amphibian Selection Guidelines

A1

Any site that supports an exceptional population of a native amphibian species (as defined in Table 28).

A2

Any site that supports breeding populations of four or more species of native amphibian and scores 5 or more from Table 28.

A3

Any site that supports a good population of Great crested Newt or Palmate Newt and scores 5 or more from Table 28.

Application (all Amphibian Guidelines)

The guidelines should be applied to all sites, excluding domestic gardens. The guidelines utilise a table for assessing population size which was developed for the selection of SSSIs (JNCC 1998). The count data for such assessments needs to be collected by suitably experienced recorders.

The boundaries of sites should include terrestrial as well as aquatic habitats of importance. These should include suitable feeding and hibernacula habitat where this is adjacent, or close to breeding ponds.

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. Ponds should ideally be within 100m of each other to form a cluster. However ponds up to 250m may be considered if they are connected by suitable terrestrial amphibian habitat.

Rationale (all Amphibian Guidelines)

Sites which support amphibian assemblages including good populations of great crested and palmate newt, or any four species or an exceptional population of any one species are of importance.

Table 28: Assessment of amphibian populations for designation as an LWS in the East Riding of Yorkshire

		Low / Small	Good/ Medium	Exceptional/ Large
Species	Method	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 or Counted at night	<10	10-100	>100
Palmate Newt	Netted in day or Counted at night	<10	10-100	>100
Common Toad	Estimated	<500	500 – 5,000	>5,000
	Counted	<100	100 – 1,000	>1,000
Common Frog	Spawn clumps counted	<50	50-500	>500

4.10 Fish

4.10.1 Background

There is relatively little widely available data on the distribution of fish species within the East Riding, especially in relation to priority or rare species. However, the diversity of riverine and estuarine habitats supports some important species. The Estuary and rivers support some migratory fish, whilst the chalk streams of the Hull catchment support some characteristic species. However, populations and breeding at individual sites may vary from year to year as fish are highly transient. Therefore when considering the designation of sites for fish it is important that recent evidence is available to support any designation.

4.10.2 Fish Selection Guidelines

F1

Any site that supports a population of a fish species listed on Annex II of the EU 'Habitats' Directive, except Bullhead *Cottus gobio*.

Application

This guideline should be applied to all sites where the species occur in suitable breeding habitat. There must be evidence of breeding, or multiple records of individuals indicating regular, rather than casual occurrence. In the case of migratory species, the site should be extended to cover the main water courses likely to be used for migration.

Rationale

All the species listed on Annex II which occur in the East Riding are rare, with the exception of Bullhead which is more widespread.

F2

Any site which supports an assemblage of 3 or more species listed on Annex II of the EU 'Habitats' Directive, or as priority species in the UK BAP

Application

This guideline should be applied to all sites where the species occur in suitable breeding habitat. There must be evidence of breeding, or multiple records of individuals indicating regular, rather than casual occurrence. In the case migratory species, the site should be extended to cover the main water courses likely to be used for migration. For this guideline species of particular relevance in the East Riding include brook and river lamprey, bullhead, burbot, European eel and brown or sea trout.

Rationale

For the purpose of this guideline it is the full Annex II list including Bullhead *Cottus gobio*. An assemblage of three of these species represents a significant interest in the East Riding.

4.11 Invertebrates

4.11.1 Background

Invertebrates cover a wide range of organisms including molluscs, worms and arthropods. The latter groups which all have adults with jointed legs, includes insects, arachnids (spiders and harvestmen) and crustaceans.

There are a very large number of invertebrate species in Britain and the East Riding. Some species groups such as butterflies and dragonflies are relatively large, easily identified and well recorded, whereas most groups are small, difficult to identify and consequently poorly recorded.

The range of some species has changed over recent decades. In general southern species appear to be expanding northwards and this may well be a response to climate change. This is best recorded with noticeable mobile species such as Dragonflies and Damselflies. Several southern species have expanded their ranges northwards in Britain and some continental species have begun to colonise Britain.

Many species of invertebrates can be extremely mobile, especially in their adult stages. As a result many records relate to individuals whose occurrence on a site is casual or transitory rather than breeding on the site. It is important when considering records of a species on a site to ascertain that the habitats on that site support a breeding population of the species concerned and not just a casual occurrence. This assessment should consider the method of collection of the record and stage of the lifecycle, for example light trap records of adult moths do not necessarily indicate breeding on site, but records of larvae (caterpillars) on the right food-plant do. Boundaries should take into account the areas of suitable habitat, micro-habitat and food-plant required to support the stages of the life cycle of the species.

4.11.2 Invertebrate Selection Guidelines – General

I1

Any site that supports a population of an invertebrate species which meets any of the following criteria:

- Fully protected under the Wildlife and Countryside Act (as amended);
- Listed in the most recent Red Data Book of British Insects;
- Listed as a Priority species in the UK Biodiversity Action Plan (BAP), excluding species listed for research only; or
- Listed as being a species of ‘principal importance for the conservation of biological diversity’ in the Natural Environment and Rural Communities Act (NERC).

Application

This guideline should be applied with regard to the most current version of each of the respective lists. Records of rare species should be supported by photographs or microscopic examination where necessary. ‘Fully protected under the Wildlife & Countryside Act’ excludes those species protected in respect of sale only.

Rationale

The species on these lists are all rare, threatened, or priorities for conservation. The UK BAP ‘research only’ species have been excluded as they are generally more common and widespread species, which have undergone recent population declines. They are not rare enough to justify site based designation for every known breeding site.

I2

Any site that supports an assemblage of 5 or more breeding invertebrate species classed as ‘Nationally Notable, or Nationally Scarce’.

Application

This guideline should be applied to species which are classified as ‘Nationally Notable’, or ‘Nationally Scarce’, by the Joint Nature Conservation Committee (JNCC) or other relevant national conservation body. Nationally Notable Species are sometimes split into ‘A’, recorded from 16-30 10 km squares in the UK and ‘B’ 31-100 10 km squares in the UK. For the purpose of these guidelines this distinction is not used.

Rationale

An assemblage of 5 breeding species of ‘Nationally Notable’ or ‘Nationally Scarce’ invertebrates has been identified as being of County significance and therefore justifies conservation by LWS designation.

I3

Any site that supports an assemblage of invertebrates which are significant in a Yorkshire or regional context.

Application

The evaluation of invertebrate assemblages is a developing science. The Invertebrate Site Register (Key 1986) uses an index as a basis for grading systems. Other systems for evaluating invertebrate assemblages may focus on regional lists, or particular habitats or taxa. Designation should be based on widely recognised systems which clearly identify a site as being of significance in a Yorkshire or regional context.

Rationale

As knowledge of invertebrates increases and new systems of evaluation are developed, sites may be recognised as being of significant interest, which should be conserved.

I4

Any site that supports aquatic invertebrate species, or an assemblage of such species, which are indicative of good water quality in a stream or river system.

Application

This guideline should be applied to sites that support aquatic invertebrates such as Caddis flies *Trichoptera*, Mayflies *Ephemeroptera* and Stoneflies *Plecoptera* which are recognised as being sensitive to pollution and therefore good indicators of streams and rivers with high water quality. Sites should be selected where the assemblage includes a range of species indicative of good water quality, or for single species where these have a high degree of sensitivity to water quality and are rare or scarce in the East Riding.

Rationale

These groups of aquatic invertebrates are recognised as indicators of good quality flowing water habitats. The degree of sensitivity to water quality varies between species, which also have different habitat preferences. The assemblages will therefore be indicative of good water quality for a particular fluvial habitat.

4.11.3 Invertebrate Selection Guidelines – Butterflies and Moths

BM1

Any site that supports a significant breeding population of a butterfly which is rare in the East Riding. The species that this guideline should currently be applied to are:

- Green hairstreak (*Callophrys rubi*); and
- Purple hairstreak (*Quercusia quercus*).

Application

This guideline should be applied to all sites where there is evidence of a naturally occurring breeding population. It should not be applied to sites with only casual records or sites where the population is known or suspected to be an unauthorised introduction. Breeding status can be determined by the presence of eggs, larvae, or pupae or by multiple sighting of adults.

Rationale

These species are rare or very localised in their distribution in the East Riding. Other rare breeding species, including Dingy Skipper *Erynnis tages*, Grayling *Hipparchia semele* and White-lettered Hairstreak *Satyrion w-album* are covered by guideline I1 as these species are listed in the UK BAP and NERC section 41.

4.11.4 Invertebrate Selection Guidelines – Dragonflies and Damselflies

DD1

Any site that supports a breeding assemblage of 10 Odonata species or has recorded a total of 15 species within 5 years.

Application

This guideline should be applied to sites with species lists compiled by suitably experienced recorders. Breeding status can be determined by either observations of females ovipositing, the identification of larvae or exuvia, or records of multiple individuals (5+). The identification of all scarce species must be accepted by the local recorder or the British Dragonfly Society.

Rationale

An assemblage of 10 or more breeding Odonata species is significant in the East Riding. In cases where breeding evidence is lacking but site records exist, a total of 15 species assumes that it is likely that at least two thirds of the species recorded at a site will be breeding there.

DD2

Any site that supports a significant breeding population of a species which is considered to be rare in the East Riding. The species to which this should be applied are:

- **Small Red-eyed Damselfly (*Erythromma viridulum*).**

Application

This guideline should be applied to all sites where there is evidence that the species has been present for either three breeding seasons, or has been proved to breed in two consecutive years. Breeding status can be determined by either observations of females ovipositing, the identification of larvae or exuvia, or records of multiple individuals (5+).

Rationale

This species has recently colonised Britain and the East Riding is currently the northern limit of its range. Its status should be kept under review. The rare breeding species Variable Damselfly (*Coenagrion pulchellum*) is covered by guideline I1 as this species is listed in the Red Data Book, UK BAP and NERC Section 41.

4.11.5 Invertebrate Selection Guidelines – Grasshoppers and Crickets

GC1

Any site that supports a breeding assemblage of 7 species of grasshoppers or crickets.

Application

This guideline should be applied to sites with species lists compiled by suitably experienced recorders. Breeding status can be determined by either observations of females ovipositing, the identification of nymphal instars, or records of multiple (5+) males stridulating (singing). This guideline should be applied to all sites where there is evidence of a naturally occurring breeding population. It should not be applied to sites with only casual records or sites where the population is known or suspected to be an unauthorised introduction.

Rationale

An assemblage of 7 or more species of grasshopper or cricket is considered significant in an East Riding context.

5. Community Value Guidelines

5.1 Background

The selection of SINC's and LWS in the East Riding has previously been based solely on ecological value and has not included any consideration of the value of sites to people. However in 2006 Defra published *Local Sites – Guidance on their identification, selection and management*. This recommended that 'Value for appreciation of nature' and 'Value for learning' should be criteria for the selection of Local Sites. Since the publication of this guidance there has been an increasing awareness of the value of natural environment for human well being. 'Reconnecting people and nature' is one of four main themes of The Natural Environment White Paper 2011. The Community Value Guideline has therefore been developed so that sites that have value for people as well as nature conservation can be recognised.

5.2 Community Value Selection Guideline

Cv1

Areas that have ecological value and also have significance in terms of their role in promoting and supplying an established regular educational use, appreciation of nature or significant enhancement of community wellbeing through access to natural green space. To qualify for designation a site must either:

- a.) Score 8-11 from Table 29 and score within 20% of the threshold for designation under a habitat or species guideline, or**
- b.) Score 12 or more from Table 29 and score within 40% of the threshold for designation under a habitat or species guideline.**

Application

To be considered for designation under the Community Value guideline all sites must meet at least one of the following criteria:

- Statutory rights of public access either through public rights of way or CRow Act open access land;
- Public ownership such as Forestry Commission or Local Authority; or
- Voluntary sector ownership such as Wildlife Trust or smaller community group.

Evidence for a site meeting the elements set out in Table 29 will be assessed via collation of general mapping, Rights of Way definitive map information, information from local community groups or parish and town councils, information provided by local schools or educational providers, site management plans with educational or general access chapters or newsletters or awareness raising material in relation to specific sites. Cultural heritage value will be evidenced through appropriate historical sources or through evaluation by a recognised expert or officer. The Council's open space review and strategy will be used as a resource to evidence the availability of open green space in the vicinity of the site.

Rationale

The 2006 Defra Guidance on Local Sites includes 'Value for Appreciation of Nature' and 'Value for Learning' among the reference criteria for selection of Local Sites. These values have been incorporated into the guidelines through Cv1 by using the level of community value in combination with lower thresholds for ecological value. This approach has been taken as it follows the principle of lower thresholds used elsewhere in the guidelines (e.g. for habitat connectivity). It also ensures that LWS designation is only applied to sites which have a demonstrable ecological value as well as a community value.

Table 29: Community Value features

Community Value feature	Score
Accessibility	
Disabled / child buggy access	1
Within 500m of a settlement of at least 100 households	1
Educational value	
Currently used for educational visits on a regular basis (3+ times per year)	3
Used for education events for the public	2
Within 500m of a school	1
Management	
Managed for nature conservation with public access	5
Involvement of local community in site management	5
Other factors	
Cultural heritage - historic landscape or others features of local cultural interest	1
Deficit of semi-natural habitats within the local area. Lack of e.g. semi-improved grassland, woodland, wetland within 5km radius.	3
Maximum Total	22