



Barnsley Natural Heritage Sites

Site Assessment Criteria (Habitat Quality)

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1. Introduction

TEP was commissioned by Barnsley Council in spring 2010, on behalf of the Barnsley Local Sites Partnership, to advise on criteria for selection of Local Wildlife Sites (also known locally as Natural Heritage Sites).

The criteria are separated into two sections, one is based on the habitat type and the other on the presence of faunal species. A site can qualify for selection if it meets one or both of these criteria.

These criteria have been developed through analysis of local wildlife site selection systems used by local authorities across England and Wales. A range of techniques, criteria and quality-thresholds are used. Doncaster's site selection system was analysed in detail, so as to maximise cross-border compatibility.

TEP has also carried out a detailed analysis of published flora and biodiversity action plans relevant to Barnsley and South Yorkshire.

TEP also carried out Phase 1 habitat surveys of 59 existing Local Wildlife sites. The survey results have also informed TEP's advice on LWS selection criteria.

The LSP has extensive knowledge of biodiversity in the Barnsley area and its views were sought as to the validity and robustness of the assessment process set out in this document.

2. Analysis of Other Assessment Systems

Most habitat quality assessment systems use the number of plant species to evaluate a site's biodiversity interest. These systems list species associated with particular habitats of biodiversity priority in the area of search. Each qualifying species scores at least 1 point. Plants of a higher conservation value, or those indicative of a healthy habitat can score additional points. Sometimes additional points are given if particular species are frequently encountered in the site; using the DAFOR scale.

LWS selection is based on a percentage of the total possible number of species encountered in typical habitats. This is usually expressed as score (e.g. Scoring 20+ species).

Other systems use a minimum coverage method; usually of species that are distinctly associated with a BAP priority habitat e.g. $\geq 25\%$ cover of Heather (*Calluna vulgaris*) or Bilberry (*Vaccinium myrtillus*) for heath-land (upland and lowland).

The occurrence/scarcity of particular habitats is also a factor in the selection criteria, for example an authority that is considered as being heavily wooded will often have more stringent parameters for selection as a wildlife site, e.g. more species, rarer species or greater size etc.

Most systems usually set a minimum size and/or dimension for a habitat to be selected.

For mosaic habitats which consist of patches of good quality habitat that are below the minimum size threshold, additional criteria are defined.

Sites are usually mapped by reference to permanent boundaries, although if not all the land consists of priority habitat, this should be noted in the designation package attached to each LWS.

The seasonal presence or breeding by important faunal species is also a consideration, for example populations of Great-crested newt (*Triturus cristatus*) or Lapwing (*Vanellus vanellus*).

3. Relationship to Biodiversity Action Plan

The plant species lists proposed for use in Barnsley's Natural Heritage Sites selection system are based on the National Vegetation Classifications (NVC) for the Barnsley Biodiversity Action Plan¹ (BAP) Habitats e.g. for Upland Oakwood, the plant species list is derived from NVC descriptions of woodland types W10 and W16.

The Barnsley BAP prioritises the following habitats in the form of a Habitat Action Plan (HAP);

- *HAP1 Upland Oakwood*
- *HAP2 Lowland Mixed Deciduous Woodland*
- *HAP3 Wet Woodland*
- *HAP4 Wood Pasture and Parkland (still in discussion)*
- *HAP5 Hedgerows*
- *HAP6 Arable Field Margins*
- *HAP7 Floodplain Grazing Marsh*
- *HAP8 Lowland Meadows*
- *HAP9 Lowland Dry Acidic Grassland*
- *HAP10 Lowland Heathland*
- *HAP11 Upland Heathland*
- *HAP12 Blanket Bog*
- *HAP13 Purple Moor Grass and Rush Pasture*
- *HAP14 Reedbeds*
- *HAP15 Ponds*
- *HAP16 Rivers*
- *HAP17 Open Mosaic Habitats on Previously Developed Land (still in discussion)*

4. Plant Species Selection

The NVC contains some species that are not present or are not native in the South Yorkshire Area. To ensure that inappropriate species were not included the VC63 (Vice County) South Yorkshire, full plant list (1999) was used, and those species not recorded were removed.

¹ Barnsley Biodiversity Action Plan (Second Edition) 2008-2012, (2009), Barnsley Biodiversity Trust

To afford conservation value to priority species, the UKBAP list was used, i.e. species on the UKBAP such as Marsh Stitchwort (*Stellaria palustris*) score higher.

Ancient Woodland Indicators (AWI) for South Yorkshire were derived from 'Rotherham's Woodland Heritage' (Jones, M), Identified in the report to the Woodland Trust 'Survey of the Coverage, Use and Application of Ancient Woodland Indicator Lists in the UK (P. Galves, I. D. Rotherham, B. Wright, C. Handley and J. Birbeck), Hallam Environmental Consultants, Sheffield Hallam University, October 2009. If the Local Sites Partnership feels these are inappropriate for the Barnsley area, adjustments can be made.

Plants known as Axiophytes are also used to assess habitat quality.

"Axiophytes are 'worthy plants' - the 40% or so of species that arouse interest and praise from botanists when they are seen. They are indicators of habitat that is considered important for conservation, such as ancient woodlands, clear water and species-rich meadows.

They are not the same as rare plants: species that have only ever been recorded in one or two sites in a county are often just chance occurrences, and have little ecological (or statistical) significance.

Lists of axiophytes provide a powerful technique for determining conservation priorities. Sites with many axiophytes are usually of greater importance than those with fewer; and changes in the number of axiophytes in a site over time can be used for monitoring the outcome of management practices."
British Botanical Society of the British Isles

21 counties of the British Isles have compiled a list of Axiophytes. South Yorkshire does not yet have a list of Axiophytes. However West Yorkshire's list has been used as a proxy in the proposals set out below. The full list of Axiophytes for West Yorkshire is appended.

Should an Axiophyte list be compiled by for South Yorkshire in the future then it would be a simple to check and make adjustment if necessary.

For sites that meet (or nearly meet) quality criteria but are excluded on the basis of site size, it is prudent to consider these sites further if several smaller sites are close together. For example, a cluster of ponds in an area may have considerable biodiversity value if they are located close to each other, even if individually they are smaller or do not reach the species criteria.

A lower threshold for selection is often used in this case, an example could be >75% of the main criteria but only if within 500m of another similar habitat. It is vital that there is some element of spatial distribution within the assessment methodology to ensure that stepping stone habitats within the landscape are retained.

Woodland

The Borough of Barnsley is home to around 2,470ha of woodland, about 7.5% of the total land area. The national average for woodland cover is around 8.1% and the average woodland cover for the South Yorkshire is 7.56%. Barnsley's woodlands are of a varied structure and type and subject to a number of different management operations, including commercial forestry.

Barnsley's Biodiversity Action Plan lists three categories of woodland as being of importance for the Barnsley area. They are Upland Oakwoods (Habitat Action Plan1), Lowland Mixed Deciduous Woodland (HAP2) and Wet Woodland (HAP 3).

Lowland mixed deciduous woodland

Lowland Mixed Deciduous

The Barnsley LBAP describes Mixed Deciduous Woodland as woods on base-rich soils in the north and west, in most of which Ash is the major species, although locally Oak (*Quercus* spp.), Birch (*Betula* spp.), Elm (*Ulmus* spp.), Small leaved Lime (*Tilia cordata*) and even Hazel (*Corylus avellana*) may be the most abundant species. Alder (*Alnus glutinosa*) may occur where there are transitions to wet woodland. Despite variations in canopy composition, the ground flora remains broadly similar. The type is also found on more acid poorly-drained soils where there is flushing of nutrients. Often these are just small fragments with irregular margins or narrow strips along flushes, riparian tracts, outcrops and steep banks. Most Mixed Deciduous Woodlands are probably ancient, but Ash (*Fraxinus excelsior*) is a vigorous colonist of open ground.

Many woods have been treated as coppice in the past, others have been wood-pastures, but most now have a high forest structure. Mixed Ash Woodlands are amongst the richest habitats for wildlife in the uplands, notable for bright displays of flowers such as Bluebell (*Hyacinthoides non-scripta*) (Wood Cranesbill (*Geranium sylvaticum*) and Ransoms. Some rare native trees are found in these woods, notably Large-leaved Lime (*Tilia platyphyllos*) and various Whitebeams (*Sorbus* spp.). Deadwood, and ancient and veteran trees, such as old Elm trees, provide habitat for rare beetles, flies and other invertebrates. Cavities in Ash trees are probably the most common roosting site for Noctule Bat (*Nyctalus noctula*). The type is also of value for the locally-rare White-letter Hairstreak Butterfly (*Satyrrium w-album*), which feeds on Elm and for bird species including Song Thrush (*Turdus philomelos*) and Willow Tit (*Poecile montanus*). This habitat is also valuable for Badgers.

National Vegetation Classifications associated with this habitat in Barnsley are W8 (*Fraxinus excelsior-Acer campestre-Mercurialis perennis*), W10 (*Quercus robur-Pteridium aquilinum-Rubus fruticosus*) and W16 (*Quercus* spp.-*Betula* spp.-*Deschampsia flexuosa*).

Lowland Mixed Deciduous Woodland Sites will be selected as Local Wildlife Sites if they meet any of the following criteria;

1. Any woodland site listed on the Ancient Woodland Inventory (AWI)
2. Any woodland that satisfies the site selection criteria for fauna
3. Any woodland ≥ 0.5 ha that has an affinity to National Vegetation Classifications **W8**, **W10** and **W16**
4. Other woodland sites that are not listed AWI that are over 0.5ha that score **20+** from Table 1.1 (ground flora) list (including **5** AWI) and **5+** from Table 1.2 (Trees)
5. Or other woodland sites that are over 0.5ha that scores **25+** from Table 1.1 (Ground Flora) and **5+** from Table 1.2 (Trees)

Species marked in **bold** score 2, these are UKBAP, Axiophytes or Ancient Woodland Indicator species². Other species score 1

Upland Oakwood

Upland Oakwood

The Barnsley Local Biodiversity Action Plan describes Upland Oakwoods as being characterised by a predominance of Oak, most commonly Sessile Oak (*Quercus petraea*), but locally Pedunculate Oak (*Quercus robur*) and Birch in the canopy, with varying amounts of Holly (*Ilex aquifolium*), Rowan (*Sorbus aucuparia*) and Hazel as the main under-storey species. The National Vegetation Classifications W11 (*Quercus petraea* - *Betula pubescens* - *Oxalis acetosella*), W16 (*Quercus* spp.-*Betula* spp. - *Deschampsia flexuosa*) and W17 (*Quercus petraea* - *Betula pubescens* - *Dicranum majus*) occur in this habitat. The range of plants found in the ground layer varies (according to the underlying soil type and degree of grazing) from Bluebell Bramble-Fern communities through Grass-Bracken dominated ones. Most Oakwoods also contain areas, often along streams or towards the base of slopes, where much richer communities occur. In such areas, Ash and Elm occur in the canopy, and there is more Hazel in the under-storey.

Ground plants include Dog's Mercury (*Mercurialis perennis*), Ramsons (*Allium ursinum*) and Tufted Hair Grass (*Deschampsia cespitosa*). Many Upland Oakwoods also hold a distinctive breeding bird assemblage – Redstart (*Phoenicurus phoenicurus*), Wood Warbler (*Phylloscopus sibilatrix*) and Pied Flycatcher (*Ficedula hypoleuca*) being associated with them throughout much of their range.

² South Yorkshire Ancient Woodland Indicators taken from Jones, M, Rotherham's Woodland Heritage. Identified in the report to the Woodland Trust 'Survey of the Coverage, Use and Application of Ancient Woodland Indicator Lists in the UK (P. Galves, I. D. Rotherham, B. Wright, C. Handley and J. Birbeck), Hallam Environmental Consultants, Sheffield Hallam University, October 2009

The invertebrate communities are not particularly well studied compared to those in some other woodland types, but Oakwoods can support a range of notable species, including the locally-rare Purple Hairstreak Butterfly (*Neozephyrus quercus*). The age of many of these woodlands means that they are important for Ancient and Veteran Trees and deadwood. They are also valuable Badger (*Meles meles*) sites.

The UKBAP identifies the following issues that threaten Upland Oakwoods;

- Over-grazing by sheep and deer throughout much of the range of the woods.
- Invasion by species such as rhododendron (*Rhododendron* spp), which shades out the ground layers and eliminates much of the conservation interest.
- Development pressures such as new roads and quarrying.
- Effects of air pollution, especially on lichen and bryophyte communities.
- In some cases, unsympathetic forest management, where felling rates, choice of broadleaf species planted, or methods of working do not yet reflect published guidelines.

Sites will be selected as Local Wildlife Sites if they meet any of the following criteria;

1. Any woodland site listed on the Ancient Woodland Inventory (AWI)
2. Any woodland that satisfies the site selection criteria for fauna
3. Any woodland ≥ 0.5 ha with an affinity to National Vegetation Classifications **W11**, **W16** and **W17**
4. Other woodland sites not listed on the AWI that are over 0.5ha that score **16+** from Table 1.1 (ground flora) (including **4+** AWI) and **4+** from Table 1.2 (Trees)
5. Other woodland sites not listed on the AWI that are over 0.5ha that score **20+** from Table 1.1 (ground flora) and **4+** from Table 1.2 (Trees)

Species marked in **bold** score 2, these are UKBAP, Axioophytes or Ancient Woodland Indicator species³. Other species score 1

³ South Yorkshire Ancient Woodland Indicators taken from Jones, M, Rotherham's Woodland Heritage. Identified in the report to the Woodland Trust 'Survey of the Coverage, Use and Application of Ancient Woodland Indicator Lists in the UK (P. Galves, I. D. Rotherham, B. Wright, C. Handley and J. Birbeck), Hallam Environmental Consultants, Sheffield Hallam University, October 2009

Table 1.1 Ground Flora Species

AWI – Ancient Woodland Indicator Species

LBAP – Barnsley Biodiversity Action Plan Priority Species

SPECIES	COMMON NAME	ATTIBUTES
<i>Achillea ptarmica</i>	Sneezewort	
<i>Adoxa moschatellina</i>	Moschatel	Axiophyte
<i>Ajuga reptans</i>	Common Bugle	AWI
<i>Alliaria petiolata</i>	Garlic Mustard	
<i>Allium ursinum</i>	Ransoms	AWI
<i>Anemone nemorosa</i>	Wood Anemone	AWI, Axiophyte
<i>Angelica sylvestris</i>	Wild Angelica	
<i>Arum maculatum</i>	Lords-and-Ladies	
<i>Athyrium filix-femina</i>	Common Lady Fern	
<i>Berula erecta</i>	Lesser Water-parsnip	Axiophyte
<i>Blechnum spicant</i>	Hard-Fern	Axiophyte
<i>Brachypodium sylvaticum</i>	False Brome	
<i>Bromopsis ramosus/ramosa</i>	Hairy-brome	Axiophyte
<i>Calluna vulgaris</i>	Heather	Axiophyte
<i>Campanula latifolia</i>	Giant Bellflower	Axiophyte
<i>Campanula trachelium</i>	Bats-in-the-belfry	AWI, Axiophyte
<i>Carex acuta</i>	Slender Tufted-sedge	Axiophyte
<i>Carex remota</i>	Remote Sedge	AWI, Axiophyte
<i>Carex sylvatica</i>	Wood Sedge	Axiophyte
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved Golden-saxifrage	Axiophyte
<i>Circaea lutetiana</i>	Enchanter's Nightshade	
<i>Clematis vitalba</i>	Old Man's Beard	
<i>Conopodium majus</i>	Pignut	AWI
<i>Convallaria majalis</i>	Lily-of-the-Valley	AWI, Axiophyte
<i>Cornus sanguinea</i>	Dogwood	
<i>Ceratocapanos claviculata</i>	Climbing Corydalis	Axiophyte
<i>Daphne laureola</i>	Spurge-laurel	Axiophyte
<i>Deschampsia cespitosa</i>	Tufted Hair-Grass	
<i>Deschampsia flexuosa</i>	Wavy Hair-Grass	
<i>Digitalis purpurea</i>	Foxglove	
<i>Dryopteris dilatata</i>	Broad Buckler-fern	
<i>Dryopteris filix-mas</i> sens.str.	Male-fern	
<i>Epilobium montanum</i>	Broad-leaved Willowherb	
<i>Euonymus europaeus</i>	Spindle	AWI, Axiophyte
<i>Euphorbia amygdaloides</i>	Wood Spurge	Axiophyte
<i>Fragaria vesca</i>	Wild Strawberry	
<i>Frangula alnus</i>	Alder Buckthorn	Axiophyte
<i>Galium odoratum</i>	Woodruff	AWI, Axiophyte
<i>Galium saxatile</i>	Heath bedstraw	
<i>Geranium robertianum</i>	Herb-robert	
<i>Geum urbanum</i>	Wood Avens	
<i>Glechoma hederacea</i>	Ground-ivy	
<i>Hedera helix</i>	Ivy	

<i>Hordelymus europaeus</i>	Wood Barley	AWI, Axiophyte
<i>Hyacinthoides non-scripta</i>	Bluebell	AWI, Axiophyte, LBAP
<i>Hypericum hirsutum</i>	Hairy St John's Wort	AWI
<i>Hypericum pulchrum</i>	Slender St John's-wort	Axiophyte
<i>Ilex aquifolium</i>	Holly	
<i>Lamiaeum galeobdolon</i>	Yellow Archangel	AWI
<i>Lapsana communis</i>	Nipplewort	
<i>Lathraea squamaria</i>	Toothwort	AWI, Axiophyte
<i>Lathyrus montanus/linifolis</i>	Bitter vetch	Axiophyte
<i>Ligustrum vulgare</i>	Wild Privet	
<i>Listera ovata</i>	Common Twayblade	Axiophyte
<i>Lonicera periclymenum</i>	Honeysuckle	
<i>Luzula pilosa</i>	Hairy Wood-rush	AWI, Axiophyte
<i>Luzula sylvatica</i>	Great Wood-rush	AWI
<i>Lysimachia nemorum</i>	Yellow Pimpernel	AWI, Axiophyte
<i>Melampyrum pratense</i>	Cow-wheat	AWI, Axiophyte
<i>Melica uniflora</i>	Wood Melick	AWI
<i>Mercurialis perennis</i>	Dog's Mercury	AWI
<i>Milium effusum</i>	Wood Millet	AWI, Axiophyte
<i>Moehringia trinervia</i>	Three-nerved Sandwort	
<i>Mycelis muralis</i>	Wall Lettuce	
<i>Myosotis sylvatica</i>	Wood Forget-me-not	
<i>Orchis mascula</i>	Early-purple Orchid	AWI, Axiophyte
<i>Oxalis acetosella</i>	Wood-sorrel	AWI
<i>Phyllitis scolopendrium</i>	Hart's Tongue	
<i>Poa nemoralis</i>	Wood Meadow-grass	Axiophyte
<i>Polygonatum multiflorum</i>	Solomon's Seal	Axiophyte
<i>Polypodium vulgare</i> agg.	Polypody	
<i>Polystichum aculeatum</i>	Hard-Shield Fern	Axiophyte
<i>Polystichum setiferum</i>	Soft-Shield Fern	Axiophyte
<i>Potentilla sterilis</i>	Barren Strawberry	AWI
<i>Primula vulgaris</i>	Primrose	AWI, Axiophyte
<i>Ranunculus auricomus</i>	Goldilocks Buttercup	Axiophyte
<i>Ranunculus ficaria</i>	Lesser Celandine	
<i>Ranunculus repens</i>	Creeping Buttercup	
<i>Rhamnus catharticus</i>	Buckthorn	Axiophyte
<i>Ribes rubrum</i>	Redcurrant	
<i>Ribes uva-crispa</i>	Gooseberry	
<i>Rosa canina</i>	Dog Rose	
<i>Rubus caesius</i>	Dewberry	
<i>Rubus saxatilis</i>	Stone Bramble	Axiophyte
<i>Rumex sanguineus</i>	Wood Dock	
<i>Sambucus nigra</i>	Elder	
<i>Sanicula europaea</i>	Sanicle	AWI, Axiophyte
<i>Silene dioica</i>	Red Campion	
<i>Solidago vigaurea</i>	Wild Goldenrod	Axiophyte
<i>Stachys sylvatica</i>	Hedge Woundwort	

<i>Stellaria holostea</i>	Greater Stitchwort	AWI
<i>Tamus communis</i>	Black Bryony	Axiophyte
<i>Teucrium scorodonia</i>	Wood Sage	
<i>Vaccinium myrtillus</i>	Bilberry	
<i>Vaccinium vitis-idaea</i>	Cowberry	Axiophyte
<i>Veronica chamaedrys</i>	Germander Speedwell	
<i>Veronica montana</i>	Wood Speedwell	AWI
<i>Veronica officinalis</i>	Heath speedwell	Axiophyte
<i>Viburnum opulus</i>	Guelder Rose	
<i>Vicia sepium</i>	Bush Vetch	AWI
<i>Viola odorata</i>	Sweet Violet	
<i>Viola riviniana</i>	Common Dog-violet	

Table 1.2 Tree Species

AWI – Ancient Woodland Indicator Species

SPECIES	COMMON NAME	ATTRIBUTES
<i>Acer campestre</i>	Field Maple	
<i>Acer pseudoplatanus</i>	Sycamore	
<i>Alnus glutinosa</i>	Alder	
<i>Betula pendula</i>	Silver Birch	
<i>Betula pubescens</i>	Downy Birch	
<i>Carpinus betulus</i>	Hornbeam	Axiophyte
<i>Castanea sativa</i>	Sweet Chestnut	
<i>Corylus avellana</i>	Hazel	
<i>Crataegus laevigata</i>	Midlands Hawthorn	AWI, Axiophyte
<i>Crataegus monogyna</i>	Hawthorn	
<i>Fagus sylvatica</i>	Beech	
<i>Fraxinus excelsior</i>	Ash	
<i>Larix spp.</i>	Larch spp	
<i>Malus sylvestris sens.lat.</i>	Crab Apple	
<i>Populus tremula</i>	Aspen	Axiophyte
<i>Prunus avium</i>	Wild Cherry	Axiophyte
<i>Prunus padus</i>	Bird Cherry	Axiophyte
<i>Quercus petraea</i>	Sessile Oak	AWI
<i>Quercus robur</i>	English Oak	
<i>Quercus Hybrid</i>	Oak Hybrid	
<i>Salix caprea</i>	Goat Willow	
<i>Salix cinerea</i>	Grey Willow	
<i>Sorbus aria agg.</i>	Common Whitebeam	
<i>Sorbus aucuparia</i>	Rowan	
<i>Sorbus torminalis</i>	Wild Service Tree	AWI
<i>Taxus baccata</i>	Yew	Axiophyte
<i>Tilia cordata</i>	Small-leaved Lime	AWI, Axiophyte
<i>Tilia platyphyllos</i>	Large-leaved Lime	
<i>Ulmus glabra</i>	Wych Elm	
<i>Ulmus minor</i>	Smooth-leaved Lime Elm	
<i>Ulmus procera</i>	English Elm	

Wet Woodland

Wet Woodland occurs on poorly drained or seasonally wet soils, usually with Alder, Birch and Willow (*Salix* spp) as the main tree species. It is found on floodplains, as successional habitat on fens, mires and bogs, along streams and hill-side flushes, and in peaty hollows. Wet Woods frequently occur in mosaic with other woodland types and with open habitats such as fens.

Wet Woodland combines elements of many other ecosystems and, as such, is important for many plants and animals. The high humidity favours Bryophyte (mosses, liverworts etc) growth. The number of invertebrates associated with Alder, Birch and Willow is very large and even quite small seepages may be valuable. There are often large amounts of deadwood, and its association with water, including log jams in streams, provides specialised habitats not found in dry woodland types.

Wet Woodland provides cover and breeding sites for Otter (*Lutra lutra*), Water Vole (*Arvicola amphibius*), Noctule Bat and Willow Tit. While few rare plant species depend on Wet Woodland, there may be relict species from former open wetlands on the sites.

The UKBAP identifies the following threats to Wet Woodland

- Clearance and conversion to other land-uses, particularly in woods recently established on wetland sites.
- Cessation of management in formerly coppiced sites may encourage succession to drier woodland types.
- Lowering of water-tables through drainage or water abstraction, resulting in change to drier woodland types.
- Inappropriate grazing levels and poaching of the soil by sheep, cattle and deer leading to a change in the woodland structure, ground flora impoverishment and difficulties for regeneration.
- Flood prevention measures, river control and canalization, leading to loss of dynamic disturbance-succession systems and invertebrate communities, as well as possible reductions in the extent of individual sites.
- Constraints on the spread of woodland from conservation sites onto adjacent ground from agriculture, industrial or residential development, leading to greater uniformity of structure across the site.
- Poor water quality arising from eutrophication, industrial effluents or rubbish dumping leading to changes in the composition of the ground flora and invertebrate communities.
- Invasion by non-native species which alter vegetation composition and lower conservation value (e.g. Indian balsam *Impatiens glandulifera*); air pollution which may influence particularly bryophyte and lichen communities; and diseases such as *Phytophthora* root disease of alder.
- Climate change, potentially resulting in changes in the vegetation communities.

National Vegetation Classifications W4, W5, W6, W7 are associated with wet woodland in the Barnsley area.

Sites will be selected as Local Wildlife Sites if they meet any of the following criteria;

1. Any woodland of a wet woodland character site listed on the Ancient Woodland Inventory (AWI)
2. Any woodland that satisfies the site selection criteria for fauna
3. Any woodland ≥ 0.25 ha with an affinity to National Vegetation Classifications **W4, W5, W6** and **W7**
4. Other woodland sites of a wet woodland character that are not listed AWI that are over 0.25ha that score **25+** from Table 1.3 (ground flora) including **10** wet woodland species and at least **4** of the wet woodland tree species from Table 1.4

Species marked in **bold** score 2, these are UKBAP, Axiophytes or Ancient Woodland Indicator species⁴. Other species score 1

Table 1.3 Wet Woodland Species List

WW - Wet Woodland

AWI – Ancient Woodland Indicator Species

SPECIES	COMMON NAME	ATTRIBUTES
<i>Achillea ptarmica</i>	Sneezewort	
<i>Adoxa moschatellina</i>	Moschatel	Axiophyte, WW
<i>Ajuga reptans</i>	Common Bugle	AWI, WW, Axiophyte
<i>Alliaria petiolata</i>	Garlic Mustard	
<i>Allium ursinum</i>	Ransoms	AWI, WW
<i>Anemone nemorosa</i>	Wood Anemone	AWI, Axiophyte
<i>Angelica sylvestris</i>	Wild Angelica	WW
<i>Berula erecta</i>	Lesser Water-parsnip	Axiophyte
<i>Blechnum spicant</i>	Hard-fern	Axiophyte
<i>Brachypodium sylvaticum</i>	False Brome	
<i>Bromopsis ramosus/ramosa</i>	Hairy-brome	Axiophyte
<i>Calamagrostis canescens</i>	Purple small reed	AWI, Axiophyte, WW
<i>Caltha palustris</i>	Marsh-marigold	Axiophyte, WW
<i>Cardamine amara</i>	Large Bitter-cress	Axiophyte, WW
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	WW
<i>Cardamine pratensis</i>	Cuckooflower	Axiophyte
<i>Carex acutiformis</i>	Lesser pond-sedge	WW
<i>Carex acuta</i>	Slender Tufted-sedge	Axiophyte
<i>Carex echinata</i>	Star Sedge	

⁴ South Yorkshire Ancient Woodland Indicators taken from Jones, M, Rotherham's Woodland Heritage. Identified in the report to the Woodland Trust 'Survey of the Coverage, Use and Application of Ancient Woodland Indicator Lists in the UK (P. Galves, I. D. Rotherham, B. Wright, C. Handley and J. Birbeck), Hallam Environmental Consultants, Sheffield Hallam University, October 2009

SPECIES	COMMON NAME	ATTRIBUTES
<i>Carex elata</i>	Tufted-sedge	Axiophyte
<i>Carex laevigata</i>	Smooth-stalked Sedge	Axiophyte
<i>Carex nigra</i>	Common Sedge	
<i>Carex paniculata</i>	Greater Tussock-sedge	Axiophyte, WW
<i>Carex pendula</i>	Pendulous Sedge	AWI, WW
<i>Carex remota</i>	Remote Sedge	AWI, Axiophyte, WW
<i>Carex riparia</i>	Greater Pond-sedge	Axiophyte, WW
<i>Carex sylvatica</i>	Wood Sedge	Axiophyte
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved Golden-saxifrage	Axiophyte, WW
<i>Circaea lutetiana</i>	Enchanter's-nightshade	
<i>Cirsium palustre</i>	Marsh Thistle	
<i>Cornus sanguinea</i>	Dogwood	
<i>Crepis paludosa</i>	Marsh Hawk's-beard	Axiophyte
<i>Deschampsia cespitosa</i>	Tufted Hair Grass	WW
<i>Digitalis purpurea</i>	Foxglove	
<i>Epilobium palustre</i>	Marsh Willowherb	
<i>Equisetum sylvaticum</i>	Wood Horsetail	AWI, WW
<i>Filipendula ulmaria</i>	Meadowsweet	WW
<i>Frangula alnus</i>	Alder buckthorn	Axiophyte, WW
<i>Galium odoratum</i>	Woodruff	AWI, Axiophyte
<i>Galium palustre</i> sens.lat.	Common Marsh-bedstraw	
<i>Galium saxatile</i>	Heath Bedstraw	
<i>Geranium robertianum</i>	Herb-Robert	
<i>Geum rivale</i>	Water Avens	AWI
<i>Hedera helix</i>	Ivy	
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	WW, Axiophyte
<i>Hypericum tetrapterum</i>	Square-stalked St John'-wort	
<i>Ilex aquifolium</i>	Holly	
<i>Iris pseudacorus</i>	Yellow Iris	WW
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	
<i>Juncus effusus</i>	Soft-rush	
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	Axiophyte
<i>Lamiastrum galeobdolon</i>	Yellow Archangel	AWI, Axiophyte
<i>Luzula sylvatica</i>	Great Wood-rush	AWI
<i>Lychnis flos-cuculi</i>	Ragged-Robin	Axiophyte
<i>Lycopus europaeus</i>	Gypsywort	
<i>Lysimachia nemorum</i>	Yellow Pimpernel	AWI, Axiophyte
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	Axiophyte
<i>Lythrum salicaria</i>	Purple-loosestrife	Axiophyte
<i>Mentha aquatica</i>	Water Mint	
<i>Menyanthes trifoliata</i>	Bog-bean	Axiophyte
<i>Mercurialis perennis</i>	Dog's mercury	AWI
<i>Milium effusum</i>	Wood Millet	AWI, Axiophyte
<i>Moehringia trinervia</i>	Three-nerved Sandwort	
<i>Molinia caerulea</i>	Purple Moor-grass	WW
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	WW
<i>Orchis mascula</i>	Early-purple Orchid	AWI, Axiophyte
<i>Osmunda regalis</i>	Royal Fern	Axiophyte
<i>Oxalis acetosella</i>	Wood-sorrel	AWI
<i>Phalaris arundinacea</i>	Reed Canary-grass	
<i>Phragmites australis</i>	Common Reed	WW
<i>Phyllitis scolopendrium</i>	Hart's Tongue	

SPECIES	COMMON NAME	ATTRIBUTES
<i>Poa nemoralis</i>	Wood Meadow-grass	Axiophyte
<i>Polypodium vulgare</i> agg.	Polypody	
<i>Potentilla palustris</i>	Marsh Cinquefoil	Axiophyte
<i>Ranunculus auricomus</i>	Goldilocks Buttercup	Axiophyte
<i>Ranunculus ficaria</i>	Lesser Celandine	
<i>Ranunculus flammula</i>	Lesser Spearwort	WW
<i>Ribes nigrum</i>	Blackcurrant	
<i>Ribes rubrum</i>	Redcurrant	
<i>Ribes uva-crispa</i>	Gooseberry	
<i>Rumex sanguineus</i>	Wood Dock	
<i>Scirpus sylvaticus</i>	Wood Club-rush	Axiophyte
<i>Scrophularia aquatica</i>	Water Figwort	
<i>Scutellaria galericulata</i>	Common Skullcap	Axiophyte, WW
<i>Solanum dulcamara</i>	Bittersweet	WW
<i>Stellaria alsine</i>	Bog Stitchwort	
<i>Stellaria holostea</i>	Greater Stitchwort	AWI
<i>Teucrium scorodonia</i>	Wood-sage	
<i>Oreopteris limbosperma</i>	Lemon Scented Fern	Axiophyte
<i>Valeriana dioica</i>	Marsh Valerian	Axiophyte
<i>Valeriana officinalis</i>	Common Valerian	WW
<i>Veronica beccabunga</i>	Brooklime	
<i>Viburnum opulus</i>	Guelder Rose	WW
<i>Viola palustris</i>	Marsh Violet	WW, Axiophyte

Table 1.4 Tree Species List

<i>Acer campestre</i>	Field Maple	
<i>Alnus glutinosa</i>	Alder	WW
<i>Betula pendula</i>	Silver Birch	
<i>Betula pubescens</i>	Downy Birch	WW
<i>Carpinus betulus</i>	Hornbeam	Axiophyte
<i>Castanea sativa</i>	Sweet Chestnut	
<i>Corylus avellana</i>	Hazel	
<i>Crataegus laevigata</i>	Midlands Hawthorn	AWI, Axiophyte
<i>Crataegus monogyna</i>	Hawthorn	
<i>Fraxinus excelsior</i>	Ash	
<i>Malus sylvestris</i> sens.lat.	Crab Apple	
<i>Populus tremula</i>	Aspen	Axiophyte, WW
<i>Prunus avium</i>	Wild Cherry	Axiophyte
<i>Prunus padus</i>	Bird Cherry	Axiophyte
<i>Quercus petraea</i>	Sessile Oak	AWI
<i>Quercus robur</i>	English Oak	
<i>Quercus Hybrid</i>	Oak Hybrid	
<i>Salix aurita</i>	Eared Willow	WW
<i>Salix caprea</i>	Goat Willow	
<i>Salix cinerea</i>	Grey Willow	WW
<i>Salix fragilis</i>	Cracked Willow	WW
<i>Salix pentandra</i>	Bay Willow	Axiophyte
<i>Salix purpurea</i>	Purple Willow	
<i>Salix viminalis</i>	Osier	WW
<i>Sorbus aucuparia</i>	Rowan	
<i>Sorbus aria</i> agg.	Common Whitebeam	

<i>Sorbus torminalis</i>	Wild Service Tree	AWI
<i>Ulmus glabra</i>	Wych Elm	
<i>Ulmus minor</i>	Smooth-leaved Lime	
<i>Ulmus procera</i>	English Elm	
<i>Viburnum lantana</i>	Wayfaring Tree	Axiophyte

Purple Moor Grass and Rush Pasture

The UKBAP and Barnsley BAP describe Purple Moor Grass and Rush Pastures as occurring on poorly drained, usually acidic soils in areas of high rainfall. They are found typically on undulating plateaux and hillsides, as well as in stream and river valleys. Vegetation is often a mosaic and may take the form of scattered areas in among other habitats.

Their vegetation, which has a distinct character, consists of various species-rich types of fen meadow and rush pasture. Purple moor grass (*Molinia caerulea*), and rushes, especially sharp flowered rush (*Juncus acutiflorus*), are usually abundant. Just as the best examples of lowland heath contain a wide range of plant communities, so the same is true for this habitat: the characteristic plant communities often occur in a mosaic with one another, together with patches of wet heath, dry grassland, swamp and scrub.

Other typical vegetation types found in Purple Moor Grass and Rush Pasture include some Sedges (*Carex* spp.) species, Marsh Thistle (*Cirsium palustre*), Meadow Buttercup (*Ranunculus acris*), wavy St. Johns-wort (*Hypericum undulatum*), Spearwort (*Ranunculus lingua*) and occasionally Sphagnum and other Mosses. Being wet, and with some cover, they are important for upland wader species such as Curlew (*Numenius arquata*), Lapwing and Snipe (*Gallinago gallinago*). They are also important habitats for other Barnsley Biodiversity Action Plan Priority Species such as Barn Owl (*Tyto alba*), Twite (*Carduelis flavirostris*) and Skylark (*Alauda arvensis*).

Many Rush Pasture areas are within enclosed land and are grazed by cattle or sheep, but very little management exists. Environmental Stewardship Schemes provide for appropriate management in creating both a dense and open sward of rush to favour breeding wader species, as well as controlling vigorous rush growth.

The UKBAP identifies the following threats to Purple Moor Grass and Rush Pasture;

- Agricultural improvement through drainage, cultivation and fertiliser applications.
- Inappropriate management, including overgrazing by sheep and too frequent burning.
- Agricultural abandonment, leading to rankness and scrub encroachment through lack of grazing.
- Fragmentation and disturbance for developments such as housing and road constructions.

Sites will be selected as local wildlife sites if they meet any of the following criteria;

1. Sites ≥ 0.5 ha that display the character of Purple Moor Grass and Rush Pasture as described above and score **12+** from Table 1.5 (not including *Molinia caerulea* and the dominant *Juncus species*)
2. Any site that satisfies the site selection criteria for fauna

Species marked in **bold** score 2, these are UKBAP and/or Axiophytes, other species score 1

Table 1.5 Purple Moor Grass and Rush Pasture

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Achillea ptarmica</i>	Sneezewort	
<i>Agrostis canina</i> sens.lat.	Velvet Bent	
<i>Agrostis capillaris</i>	Common Bent	
<i>Agrostis stolonifera</i>	Creeping Bent	
<i>Anagallis tenella</i>	Bog Pimpernel	Axiophyte
<i>Cardamine pratensis</i>	Cuckooflower	Axiophyte
<i>Carex acutiformis</i>	Lesser Pond-sedge	
<i>Carex disticha</i>	Brown Sedge	Axiophyte
<i>Carex elata</i>	Tufted Sedge	Axiophyte
<i>Carex hostiana</i>	Tawny Sedge	Axiophyte
<i>Carex nigra</i>	Common Sedge	
<i>Carex leporina</i>	Oval Sedge	
<i>Carex panicea</i>	Carnation Sedge	
<i>Carex pulicaris</i>	Flea Sedge	Axiophyte
<i>Carex rostrata</i>	Bottle Sedge	Axiophyte
<i>Cirsium palustre</i>	Marsh Thistle	
<i>Crepis paludosa</i>	Marsh Hawk's-beard	Axiophyte
<i>Dactylorhiza maculata</i>	Heath Spotted Orchid	Axiophyte
<i>Danthonia decumbens</i>	Heath Grass	Axiophyte
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	Axiophyte
<i>Epilobium hirsutum</i>	Great Willowherb	
<i>Epipactis palustris</i>	Marsh Hellborine	Axiophyte
<i>Equisetum palustre</i>	Marsh Horsetail	
<i>Erica tetralix</i>	Cross-leaved Heather	Axiophyte
<i>Eriophorum angustifolium</i>	Common Cottongrass	
<i>Filipendula ulmaria</i>	Meadowsweet	
<i>Galium palustre</i> sens.lat.	Marsh Bedstraw	
<i>Geum rivale</i>	Water Avens	
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	Axiophyte
<i>Hypericum tetrapterum</i>	Square-stalked St John's Wort	
<i>Iris pseudacorus</i>	Yellow Flag-iris	
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	
<i>Juncus articulatus</i>	Jointed Rush	
<i>Juncus bulbosus</i>	Bulbous Rush	

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Juncus conglomeratus</i>	Compact Rush	
<i>Juncus effusus</i>	Soft Rush	
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	Axiophyte
<i>Lathyrus pratensis</i>	Meadow Vetchling	
<i>Lotus uliginosus/pendunculatus</i>	Common Bird's-foot Trefoil	
<i>Lychnis flos-cuculi</i>	Ragged Robin	Axiophyte
<i>Lycopus europaeus</i>	Gipsywort	
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	Axiophyte
<i>Lythrum salicaria</i>	Purple Loosestrife	Axiophyte
<i>Mentha aquatica</i>	Water Mint	
<i>Menyanthes trifoliata</i>	Bog Bean	Axiophyte
<i>Molinia caerulea</i>	Purple Moor-grass	
<i>Myosotis laxa</i>	Tufted Forget-me-not	
<i>Myosotis scorpioides</i>	Water Forget-me-not	
<i>Myosotis secunda</i>	Creeping Forget-me-not	
<i>Nardus stricta</i>	Mat Grass	
<i>Narthecium ossifragum</i>	Bog Asphodel	Axiophyte
<i>Osmunda regalis</i>	Royal Fern	Axiophyte
<i>Pedicularis palustris</i>	Marsh Lousewort	Axiophyte
<i>Pedicularis sylvatica</i>	Lousewort	Axiophyte
<i>Phalaris arundinacea</i>	Reed Canary-grass	
<i>Phragmites australis</i>	Common Reed	
<i>Plantago lanceolata</i>	Ribwort Plantain	
<i>Polygala vulgaris</i>	Common Milkwort	
<i>Persicaria amphibium</i>	Amphibious Bistort	Axiophyte
<i>Potentilla erecta</i>	Tormentil	Axiophyte
<i>Potentilla palustris</i>	Marsh Cinquefoil	Axiophyte
<i>Pulicaria dysenterica</i>	Common Fleabane	Axiophyte
<i>Ranunculus flammula</i>	Lesser Spearwort	
<i>Scrophularia auriculata</i>	Water Figwort	
<i>Scutellaria galericulata</i>	Skullcap	Axiophyte
<i>Scutellaria minor</i>	Lesser Skullcap	Axiophyte
<i>Senecio aquaticus</i>	Marsh Ragwort	
<i>Stellaria alsine</i>	Bog Stitchwort	
<i>Stellaria graminea</i>	Lesser Stitchwort	
<i>Stellaria palustris</i>	Marsh Stitchwort	Axiophyte
<i>Succisa pratensis</i>	Devil's-bit Scabious	Axiophyte
<i>Triglochin palustris/palustre</i>	Marsh Arrowgrass	Axiophyte
<i>Vaccinium oxycoccus</i>	Cranberry	Axiophyte
<i>Valeriana dioica</i>	Marsh Valerian	Axiophyte
<i>Valeriana officinalis</i>	Common Valerian	
<i>Veronica beccabunga</i>	Brooklime	
<i>Veronica scutellata</i>	Marsh Speedwell	Axiophyte
<i>Viola palustris</i>	Marsh Violet	Axiophyte

Reedbeds

The UKBAP describes Reedbeds as wetlands dominated by stands of the common reed (*Phragmites australis*), wherein the water table is at or above ground level for most of the year. They tend to incorporate areas of open water and ditches,

Reedbeds are amongst the most important habitats for birds in the UK. They support a distinctive breeding bird assemblage including 6 nationally rare Red Data Birds the bittern (*Botaurus stellaris*) also a Barnsley BAP Priority Species, marsh harrier, (*Circus aeruginosus*), crane (*Grus grus*), Cetti`s warbler (*Cettia cetti*), Savi`s warbler (*Locustella luscinioides*) and bearded tit (*Panurus biarmicus*), provide roosting and feeding sites for migratory species (including the globally threatened aquatic warbler (*Acrocephalus paludicola*) and are used as roost sites for several raptor species in winter. Five GB Red Data Book invertebrates are also closely associated with reedbeds including the locally-rare Fen Wainscot Moth (*Arenostola phragmitidis*) whose larvae feed in the stems of Common Reed.

Reedbeds are important for Otter, Water Vole and Bats, all Barnsley Biodiversity Action Plan Priority Species. In Barnsley the largest concentrations of this type of habitat is along the Dearne Valley.

The UKBAP identifies the following threats to reedbeds;

- Small total area of habitat and critically small population sizes of several key species dependent on the habitat.
- Loss of area by excessive water extraction and, in the past, land drainage and conversion to intensive agriculture.
- Lack of or inappropriate management of existing reedbeds leading to drying, scrub encroachment and succession to woodland.
- Pollution of freshwater supplies to the reedbed: siltation may lead to drying; toxic chemicals may lead to loss of fish and amphibian prey for key species; accumulation of poisons in the food chain and eutrophication may cause reed death.

Sites will be selected as local wildlife sites if they meet any of the following criteria;

1. Is ≥ 25 ha and dominated by *Phragmites australis* and scores **6+** from Table 1.6
2. Satisfies the site selection criteria for fauna
3. Or buffers other priority habitats such as Ponds and Rivers and Streams

Species marked in **bold** score 2, these are UKBAP and/or Axiophytes, other species score 1

Table 1.6 Reedbed Species List

SPECIES	COMMON NAME	ATTRIBUTES
<i>Agrostis stolonifera</i>	Creeping Bent	
<i>Apium nodiflorum</i>	Fool's Water-cress	
<i>Athyrium filix-femina</i>	Common Lady Fern	
<i>Berula erecta</i>	Water Parsnip	Axiophyte
<i>Betula pubescens</i>	Downy Birch	
<i>Calamagrostis canescens</i>	Purple Small-reed	Axiophyte
<i>Calamagrostis epigejos</i>	Wood Small-reed	
<i>Callitriche stagnalis</i> sens.lat	Common Water-starwort	
<i>Caltha palustris</i>	Marsh Marigold	Axiophyte
<i>Carex acuta</i>	Slender Tufted Sedge	Axiophyte
<i>Carex acutiformis</i>	Lesser Pond-sedge	
<i>Carex elata</i>	Tufted Sedge	Axiophyte
<i>Carex nigra</i>	Common Sedge	
<i>Carex otrubae</i>	False fox-sedge	
<i>Carex panicea</i>	Carnation Sedge	
<i>Carex paniculata</i>	Greater tussock sedge	Axiophyte
<i>Carex pseudocyperus</i>	Cyperus sedge	Axiophyte
<i>Carex riparia</i>	Great pond-sedge	Axiophyte
<i>Eleocharis palustris</i>	Common Spike-rush	
<i>Epilobium hirsutum</i>	Great Willowherb	
<i>Epilobium palustre</i>	Marsh Willowherb	
<i>Equisetum fluviatile</i>	Water Horsetail	
<i>Equisetum palustre</i>	Marsh Horsetail	
<i>Eupatorium cannabinum</i>	Hemp Agrimony	
<i>Filipendula ulmaria</i>	Meadowsweet	
<i>Frangula alnus</i>	Alder Buckthorn	Axiophyte
<i>Galium palustre</i> sens.lat.	Common Marsh-bedstraw	
<i>Glyceria maxima</i>	Reed Sweet-grass	
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	Axiophyte
<i>Hypericum elodes</i>	Marsh St John's Wort	Axiophyte
<i>Hypericum tetrapterum</i>	Square-stalked St John's Wort	
<i>Iris pseudacorus</i>	Yellow Flag-iris	
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	
<i>Juncus articulatus</i>	Jointed Rush	
<i>Juncus bulbosus</i>	Bulbous Rush	
<i>Juncus effusus</i>	Soft Rush	
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	Axiophyte
<i>Lemna minor</i>	Common Duckweed	
<i>Lotus uliginosus</i>	Greater Bird's-foot Trefoil	
<i>Lychnis flos-cuculi</i>	Ragged Robin	Axiophyte
<i>Lycopus europaeus</i>	Gipsywort	
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	Axiophyte
<i>Lythrum salicaria</i>	Purple Loosestrife	Axiophyte
<i>Mentha aquatica</i>	Water mint	
<i>Menyanthes trifoliata</i>	Bog Bean	Axiophyte
<i>Myosotis laxa</i>	Tufted Forget-me-not	
<i>Myosotis scorpioides</i>	Forget-me-not	
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	
<i>Oenanthe fistulosa</i>	Tubular Water-dropwort	UKBAP, Axiophyte

SPECIES	COMMON NAME	ATTRIBUTES
<i>Phalaris arundinacea</i>	Reed Canary-grass	
<i>Phragmites australis</i>	Common Reed	
<i>Persicaria amphibia</i>	Amphibious Bistort	Axiophyte
<i>Potentilla palustris</i>	Marsh Cinquefoil	Axiophyte
<i>Pulicaria dysenterica</i>	Common Fleabane	Axiophyte
<i>Ranunculus flammula</i>	Lesser Spearwort	
<i>Ranunculus lingua</i>	Greater Spearwort	Axiophyte
<i>Rumex hydrolapathum</i>	Water Dock	Axiophyte
<i>Salix cinerea</i>	Grey Willow	
<i>Scrophularia aquatica</i>	Water Figwort	
<i>Scutellaria galericulata</i>	Skullcap	Axiophyte
<i>Senecio aquaticus</i>	Marsh Ragwort	Axiophyte
<i>Solanum dulcamara</i>	Bittersweet	
<i>Sparganium erectum</i>	Branched Bur-reed	
<i>Stachys palustris</i>	Marsh Woundwort	Axiophyte
<i>Stellaria alsine</i>	Bog Stitchwort	
<i>Stellaria palustris</i>	Marsh Stitchwort	UKBAP, Axiophyte
<i>Succisa pratensis</i>	Devil's-bit Scabious	Axiophyte
<i>Symphytum officinale</i>	Common Comfrey	Axiophyte
<i>Thalictrum flavum</i>	Common Meadow-rue	Axiophyte
<i>Typha latifolia</i>	Great Reedmace	
<i>Valeriana dioica</i>	Marsh Valerian	Axiophyte
<i>Valeriana officinalis</i>	Common Valerian	
<i>Veronica beccabunga</i>	Brooklime	
<i>Veronica scutellata</i>	Marsh Speedwell	Axiophyte

Upland Heath

The UKBAP describes Upland Heathland as a habitat occurring widely on mineral soils and thin peats (<0.5 m deep) throughout the uplands and moorlands of the UK. It is characterised by the presence of dwarf shrubs at a cover of at least 25%. Blanket bog vegetation may also contain substantial amounts of dwarf shrubs, but is distinguished from heathland by its occurrence on deep peat (>0.5 m). For the purposes of the UKBAP plan upland heathland is defined as lying below montane zone (at about 600-750 m 1960-2460ft) and usually above the upper edge of enclosed agricultural land (generally at around 250-400 m 820-1300ft).

Blanket bog and other mires, grassland, bracken, scrub, trees and woodland, freshwater and rock habitats frequently form intimate mosaics with heathland vegetation in upland situations. The UKBAP recognises the importance of this habitat mosaic.

Upland heath in 'favourable condition' is typically dominated by a range of dwarf shrubs such as heather (*Calluna vulgaris*), bilberry (*Vaccinium myrtillus*), crowberry (*Empetrum nigrum*), bell heather (*Erica cinerea*). Wet heath is most commonly found in the wetter north and west and, in 'favourable condition', should be dominated by mixtures of cross-leaved heath (*Erica tetralix*), deer

grass (*Scirpus cespitosus*), heather and purple moor-grass (*Molinia caerulea*), over an under-storey of mosses often including carpets of Sphagnum species.

This habitat is distinct from blanket mire which occurs on deeper peat and which usually contains frequent occurrence of hare's-tail cotton-grass (*Eriophorum vaginatum*) and characteristic mosses. High quality heaths are generally structurally diverse, containing stands of vegetation with heather at different stages of growth. Upland heath in 'favourable condition' also usually includes areas of mature heather.

National Vegetation Classification (NVC) plant communities found within upland heath include. H12 *Calluna vulgaris* - *Vaccinium myrtillus* (is particularly widespread in the east.), H18 *Vaccinium myrtillus* – *Deschampsia flexuosa* is generally widespread in the uplands but other communities are more local in distribution, notably H9 *Calluna vulgaris* - *Deschampsia flexuosa*, and M16 *Erica tetralix* - *Sphagnum compactum*.

The distribution of these communities is influenced by climate, altitude, aspect, slope and management practices including grazing and burning. An important assemblage of birds is associated with upland heath, including red grouse (*Lagopus lagopus*), black grouse (*Tetrao tetrix*), merlin (*Falco columbarius*) and hen harrier (*Circus cyaneus*).

The Western Moors in Barnsley are where nearly all of the Borough's upland heath can be found and is an important part of the Pennine Upland habitats supporting several of the above species including the twite (*Carduelis flavirostris*) a local BAP species and Golden plover (*Pluvialis apricaria*). In addition to this the small streams are home to populations of water vole.

- Threats to upland heathland include;
- Over-grazing
- Inappropriate burning
- Afforestation
- Drainage and agricultural improvement

In Barnsley much of the upland heath lies within the Peak National Park and a significant proportion of this is designated as a Site of Significant Scientific Interest (SSSI). For heathland outside of the National Park boundary to be designated as a local wildlife site it must fulfil the following criteria.

Upland Heathland sites will be selected as local wildlife sites if they meet any of the following criteria;

1. Sites over .25ha that contain $\geq 25\%$ coverage of one or more of the following dwarf shrubs:

<i>Calluna vulgaris</i>	Heather
<i>Erica cinerea</i>	Bell Heather
<i>Erica tetralix</i>	Cross-leaved Heather
<i>Vaccinium myrtillus</i>	Bilberry/Winberry
<i>Vaccinium vitis-idea</i>	Cowberry

Ulex species Gorse spp. (in combination with dwarf shrubs)
Empetrum nigrum Crowberry

2. Satisfy the site selection criteria for fauna

Lowland Heath

The UKBAP describes lowland heathland as being a broadly open landscape on impoverished, acidic mineral and shallow peat soil, which is characterised by the presence of plants such as heathers and dwarf gorses. It is generally found below 300m (980ft) in the UK, but in more northerly latitudes the altitudinal limit is often lower.

Areas of heathland in good condition should consist of an ericaceous layer (Heather and Bell Heather) of varying heights and structures, plus some or all of the following additional features, depending on environmental and/or management conditions; scattered and clumped trees and scrub; bracken; areas of bare ground; areas of acid grassland; lichens; gorse; wet heaths, bogs and open waters.

Lowland heathland is a dynamic habitat which undergoes significant changes in different successional stages, from bare ground (e.g. after burning or tree clearing) and grassy stages, to mature, dense heath. These different stages often co-occur on a site. The presence and numbers of characteristic birds, reptiles, invertebrates, vascular plants, bryophytes and lichens are important indicators of habitat quality. In terms of distinguishing between lowland heathland and genuine acid grassland, less than 25% dwarf shrub cover should be assessed as grassland, over 25% as heathland.

Lowland heathland supports a number of nationally important species including Brown hare (*Lepus europaeus*), Green Hairstreak Butterfly (*Callophrys rubi*) and a number of reptiles including the adder (*Vipera berus*).

Lowland heathland is threatened by a number of factors including;

- Burning
- Nutrient enrichment
- Agricultural practices

Lowland heathland sites will be considered for local wildlife site selection if they meet the following criteria;

1. Sites over .25ha that contain $\geq 25\%$ coverage of one or more of the following dwarf shrubs:

<i>Calluna vulgaris</i>	Heather
<i>Erica cinerea</i>	Bell Heather
<i>Erica tetralix</i>	Cross-leaved Heather
<i>Vaccinium myrtillus</i>	Bilberry/Winberry
<i>Vaccinium vitis-idea</i>	Cowberry
<i>Ulex species</i>	Gorse spp. (in combination with dwarf shrubs)

Empetrum nigrum Crowberry

2. Satisfy the site selection criteria for fauna

Rivers

River and streams are some of the most important natural corridors in our landscape. They provide cover and continuous connected networks along which wildlife can move. Bank-side vegetation along watercourses provides a corridor for those species that are not necessarily associated with rivers.

The main watercourses in Barnsley are the Don and the Dearne; other smaller watercourses include Daking Brook, Cawthorne Dike, Silkstone Beck and the River Dove.

Rivers and streams are home to several of Barnsley's Biodiversity Action Plan Priority Species including White-clawed Crayfish (*Austropotamobius pallipes*), water vole, salmon (*Salmo salar*), otter and Bullhead/Miller's Thumb (*Cottus gobio*). Other species such as eel (*Anguilla anguilla*) and Eurasian Kingfisher (*Alcedo atthis*) depend on rivers and streams and are both good indicators of a watercourse's health.

The UKBAP identifies a number of threats to our rivers and streams;

- Pollution including eutrophication and acidification.
- Excessive ground water and surface water abstraction.
- Construction of dams and reservoirs.
- Water transfer schemes between rivers.
- Land drainage and flood defence works which if not sensitively carried out, can reduce stream habitat and isolate streams from their floodplains.
- Inappropriate bank management, including overgrazing.
- Introduction of invasive plant and animal species.
- Industrial and housing development within the floodplain.

Rivers and streams will be selected as local wildlife sites if they satisfy any of the following criteria;

1. Connects areas of biodiversity value such as Natural Heritage Sites, UKBAP LBAP Priority habitats, SSSIs designated for their biodiversity interest
2. Satisfy the site selection criteria for fauna
3. Or Scores **12+** from Table 1.6 river species scoring sheet

Once selected as wildlife sites, the site boundary should include a buffer strip of at least 10m of natural vegetation.

Species marked in **bold** score 2, these are UKBAP and/or Axiophytes, other species score 1

Table 1.6 River Species

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Alisma plantago-aquatica</i>	Common Water-plantain	Axiophyte
<i>Apium nodiflorum</i>	Fool's Water-cress	
<i>Berula erecta</i>	Lesser Water-parsnip	Axiophyte
<i>Bidens tripartita</i>	Trifid Bur-marigold	Axiophyte
<i>Callitriche hamulata sens.lat.</i>	Intermediate Water-starwort	Axiophyte
<i>Callitriche hermaphroditica</i>	Autumnal Water-starwort	
<i>Callitriche platycarpa</i>	Various-leaved Water-starwort	
<i>Callitriche stagnalis sens.lat</i>	Common Water-starwort	
<i>Equisetum fluviatile</i>	Water Horsetail	
<i>Glyceria declinata</i>	Small Sweet-grass	
<i>Glyceria fluitans</i>	Floating Sweet-grass	
<i>Glyceria plicata/notata</i>	Plicate Sweet-grass	
<i>Groenlandia densa</i>	Opposite-leaved Pondweed	Axiophyte
<i>Hippuris vulgaris</i>	Common Mare's Tail	Axiophyte
<i>Juncus bulbosus</i>	Bulbous Rush	
<i>Lemna minor</i>	Common Duckweed	
<i>Lemna trisulca</i>	Ivy-leaved Duckweed	Axiophyte
<i>Mentha aquatica</i>	Water Mint	
<i>Myosotis scorpioides</i>	Water Forget-me-not	
<i>Myriophyllum alterniflorum</i>	Alternate-flowered Water-milfoil	Axiophyte
<i>Myriophyllum spicatum</i>	Spiked Water-milfoil	Axiophyte
<i>Nasturtium officinale</i>	Watercress	
<i>Nuphar lutea</i>	Yellow Water-lily	Axiophyte
<i>Nymphaea alba</i>	White Water-lily	
<i>Nymphoides peltata</i>	Fringed Water-lily	
<i>Oenanthe aquatica</i>	Fine-leaved Water-dropwort	Axiophyte
<i>Phalaris arundinacea</i>	Reed Canary-grass	
<i>Persicaria amphibium</i>	Amphibious Bistort	Axiophyte
<i>Persicaria hydropiper</i>	Water-pepper	
<i>Potamogeton berchtoldii</i>	Small Pondweed	
<i>Potamogeton crispus</i>	Curled Pondweed	
<i>Potamogeton pectinatus</i>	Fennel Pondweed	
<i>Potamogeton perfoliatus</i>	Perfoliate Pondweed	
<i>Potamogeton pusillus</i>	Lesser Pondweed	Axiophyte
<i>Potamogeton trichoides</i>	Hair-like Pondweed	Axiophyte
<i>Ranunculus aquatilis sens.lat.</i>	Water-crowfoot	Axiophyte
<i>Ranunculus circinatus</i>	Fan-leaved Water-crowfoot	Axiophyte
<i>Ranunculus fluitans</i>	River Water-crowfoot	
<i>Ranunculus hederaceus</i>	Ivy-leaved Crowfoot	
<i>Ranunculus omiophyllus</i>	Round-leaved Crowfoot	
<i>Ranunculus peltatus</i>	Pond Water-crowfoot	
<i>Ranunculus sceleratus</i>	Celery-leaved Buttercup	Axiophyte
<i>Ranunculus trichophyllus</i>	Thread-leaved Water-crowfoot	Axiophyte
<i>Sagittaria sagittifolia</i>	Arrowhead	Axiophyte
<i>Sparganium emersum</i>	Unbranched Bur-reed	Axiophyte
<i>Sparganium erectum</i>	Branched Bur-reed	
<i>Veronica beccabunga</i>	Brooklime	
<i>Zannichellia palustris</i>	Horned Pondweed	Axiophyte

Ponds

The UKBAP defines ponds as permanent and seasonal water-bodies up to 2ha in extent. A pond should be considered as a UKBAP Priority Habitat if it meets one of the following criteria;

- 'Habitats of international importance: Ponds that meet criteria under Annex I of the Habitats Directive.'
- 'Species of high conservation importance: Ponds supporting Red Data Book species, UK BAP Species i.e. otter, water vole, species fully protected under the Wildlife and Countryside Act Schedule 5 and 8, Habitats Directive Annex II species i.e. Great-crested Newt (*Triturus cristatus*), a Nationally Scarce wetland plant species, or three Nationally scarce aquatic invertebrate species.'
- 'Exceptional assemblages of key biotic groups: Ponds supporting exceptional populations or numbers of key species. Based on (i) criteria specified in guidelines for the selection of biological SSSIs (currently amphibians and dragonflies only), and (ii) exceptionally rich sites for plants or invertebrates (i.e. supporting ≥ 30 wetland plant species or ≥ 50 aquatic macroinvertebrate species).'
- 'Ponds of high ecological quality: Ponds classified in the top PSYM category ("high") for ecological quality (i.e. having a PSYM score $\geq 75\%$). [PSYM (the Predictive SYstem for Multimetrics) is a method for assessing the biological quality of still waters in England and Wales; plant species and / or invertebrate families are surveyed using a standard method; the PSYM model makes predictions for the site based on environmental data and using a minimally impaired pond dataset; comparison of the prediction and observed data gives a % score for ponds quality].'
- 'Other important ponds: Individual ponds or groups of ponds with a limited geographic distribution recognised as important because of their age, rarity of type or landscape context.'

For Barnsley ponds should be selected as local wildlife sites if they meet any of the following criteria;

1. Any that meets the above criteria set out in the UKBAP
2. Satisfy the site selection criteria for fauna
3. Or scores **12+** from Table 1.7 ponds scoring sheet (at least **6** of which should be submerged/emergent vegetation
4. Or is located within a Local Wildlife Site
5. Or scores **15+** from Table 1.7 and is within 300m of two other ponds that meet any of the above criteria (including scoring **9+**)

Once selected as wildlife sites, the site boundary should include a surrounding buffer of natural vegetation of >5m

Species marked in **bold** score 2, these are UKBAP and/or Axiophytes, other species score 1

Table 1.7 Pond Species Scoring Sheet

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Acorus calamus</i>	Sweet-flag	Axiophyte
<i>Agrostis stolonifera</i>	Creeping Bent	
<i>Alisma lanceolatum</i>	Narrow-leaved Water-plantain	Axiophyte
<i>Alisma plantago-aquatica</i>	Common Water-plantain	Axiophyte
<i>Alnus glutinosa</i>	Alder	
<i>Alopecurus geniculatus</i>	Marsh Foxtail	
<i>Apium nodiflorum</i>	Fool's Water-cress	
<i>Baldellia ranunculoides</i>	Lesser Water-plantain	Axiophyte
<i>Berula erecta</i>	Lesser Water-parsnip	Axiophyte
<i>Bidens tripartita</i>	Trifid Bur-marigold	Axiophyte
<i>Butomus umbellatus</i>	Flowering Rush	Axiophyte
<i>Callitriche agg.</i>	Water-starwort	
<i>Callitriche hamulata sens.lat.</i>	Callitriche hamulata	Axiophyte
<i>Callitriche hermaphroditica</i>	Autumnal Water-starwort	
<i>Callitriche obtusangula</i>	Blunt-fruited Water-starwort	
<i>Callitriche platycarpa</i>	Various-leaved Water-starwort	
<i>Callitriche stagnalis sens.lat</i>	Common Water-starwort	
<i>Caltha palustris</i>	Marsh Marigold	Axiophyte
<i>Cardamine pratensis</i>	Cuckoo Flower	
<i>Carex acuta</i>	Slender Tufted Sedge	Axiophyte
<i>Carex acutiformis</i>	Lesser Pond Sedge	
<i>Carex diandra</i>	Lesser Tussock Sedge	Axiophyte
<i>Carex elata</i>	Tufted Sedge	Axiophyte
<i>Carex otrubae</i>	False Fox Sedge	
<i>Carex paniculata</i>	Greater Tussock Sedge	Axiophyte
<i>Carex pseudocyperus</i>	Cyperus Sedge	Axiophyte
<i>Carex riparia</i>	Great Pond Sedge	Axiophyte
<i>Carex rostrata</i>	Bottle Sedge	Axiophyte
<i>Carex vesicaria</i>	Bladder Sedge	Axiophyte
<i>Ceratophyllum demersum</i>	Rigid Hornwort	Axiophyte
<i>Cirsium palustre</i>	Marsh Thistle	
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	
<i>Eleocharis palustris</i>	Common Spike-rush	
<i>Epilobium hirsutum</i>	Great Willowherb	
<i>Epilobium palustre</i>	Marsh Willowherb	
<i>Epipactis palustris</i>	Marsh Helleborine	Axiophyte
<i>Equisetum fluviatile</i>	Water Horsetail	
<i>Equisetum palustre</i>	Marsh Horsetail	
<i>Equisetum telmateia</i>	Great Horsetail	
<i>Eriophorum angustifolium</i>	Common Cottongrass	
<i>Eupatorium cannabinum</i>	Hemp Agrimony	

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Filipendula ulmaria</i>	Meadowsweet	
<i>Galium palustre sens.lat.</i>	Marsh Bedstraw	
<i>Galium uliginosum</i>	Fen Bedstraw	Axiophyte
<i>Glyceria declinata</i>	Small Sweet-grass	
<i>Glyceria fluitans</i>	Floating Sweet-grass	
<i>Glyceria maxima</i>	Reed Sweet-grass	
<i>Glyceria (notata) plicata</i>	Plicate Sweet-grass	
<i>Groenlandia densa</i>	Opposite-leaved Pondweed	Axiophyte
<i>Hippuris vulgaris</i>	Mare's-tail	Axiophyte
<i>Hottonia palustris</i>	Water-violet	Axiophyte
<i>Hydrocotyle vulgaris</i>	Marsh Pennywort	Axiophyte
<i>Hypericum elodes</i>	Marsh St John's Wort	Axiophyte
<i>Iris pseudacorus</i>	Yellow Iris	
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	
<i>Juncus articulatus</i>	Jointed Rush	
<i>Juncus bufonius sens.lat.</i>	Toad Rush	
<i>Juncus bulbosus</i>	Bulbous Rush	
<i>Juncus conglomeratus</i>	Compact Rush	
<i>Juncus effusus</i>	Soft Rush	
<i>Juncus inflexus</i>	Hard Rush	
<i>Lemna gibba</i>	Fat Duckweed	Axiophyte
<i>Lemna minor</i>	Common Duckweed	
<i>Lemna trisulca</i>	Ivy-leaved Duckweed	Axiophyte
<i>Lotus pendunculatus/uliginosus</i>	Greater Bird's-foot Trefoil	
<i>Luronium natans</i>	Floating Water-plantain	UKBAP
<i>Lychnis flos-cuculi</i>	Ragged Robin	Axiophyte
<i>Lycopus europaeus</i>	Gipsywort	
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	Axiophyte
<i>Lythrum salicaria</i>	Purple Loosestrife	Axiophyte
<i>Mentha aquatica</i>	Water mint	
<i>Menyanthes trifoliata</i>	Bog Bean	Axiophyte
<i>Myosotis laxa</i>	Tufted Forget-me-not	
<i>Myosotis scorpioides</i>	Forget-me-not	
<i>Myriophyllum alterniflorum</i>	Alternate-leaved Water-milfoil	Axiophyte
<i>Myriophyllum spicatum</i>	Spiked Water-milfoil	Axiophyte
<i>Myriophyllum verticillatum</i>	Whorled Water-milfoil	Axiophyte
<i>Nasturtium officinale</i>	Water-cress	
<i>Nuphar lutea</i>	Yellow Water-lily	Axiophyte
<i>Nymphaea alba</i>	White Water-lily	
<i>Nymphoides peltata</i>	Fringed Water-lily	
<i>Oenanthe aquatica</i>	Fine-leaved Water-dropwort	Axiophyte
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	
<i>Oenanthe fistulosa</i>	Tubular Water-dropwort	Axiophyte
<i>Phalaris arundinacea</i>	Reed Canary-grass	
<i>Phragmites australis</i>	Common Reed	
<i>Polygonum/Persicaria amphibium</i>	Amphibious Bistort	
<i>Polygonum/Persicaris hydropiper</i>	Water-pepper	
<i>Potamogeton berchtoldii</i>	Small Pondweed	Axiophyte
<i>Potamogeton coloratus</i>	Fen Pondweed	
<i>Potamogeton compressus</i>	Grass-wrack Pondweed	UKBAP

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Potamogeton crispus</i>	Curled Pondweed	Axiophyte
<i>Potamogeton natans</i>	Broad-leaved Pondweed	
<i>Potamogeton pectinatus</i>	Fennel pondweed	
<i>Potamogeton perfoliatus</i>	Perfoliate Pondweed	
<i>Potamogeton polygonifolius</i>	Bog Pondweed	
<i>Potamogeton pusillus</i>	Lesser Pondweed	
<i>Potamogeton trichoides</i>	Hair-like Pondweed	
<i>Potentilla anserina</i>	Silverweed	Axiophyte
<i>Potentilla palustris</i>	Marsh Cinquefoil	
<i>Pulicaria dysenterica</i>	Common Fleabane	Axiophyte
<i>Ranunculus acris</i>	Meadow Buttercup	Axiophyte
<i>Ranunculus aquatilis sens.lat.</i>	Common Water-crowfoot	
<i>Ranunculus circinatus</i>	Fan-leaved Water-crowfoot	Axiophyte
<i>Ranunculus flammula</i>	Lesser Spearwort	Axiophyte
<i>Ranunculus hederaceus</i>	Ivy-leaved Crowfoot	
<i>Ranunculus lingua</i>	Greater Spearwort	
<i>Ranunculus omiophyllus</i>	Round-leaved Crowfoot	Axiophyte
<i>Ranunculus peltatus</i>	Pond Water-crowfoot	
<i>Ranunculus sceleratus</i>	Celery-leaved Buttercup	Axiophyte
<i>Ranunculus trichophyllus</i>	Thread-leaved Water-crowfoot	Axiophyte
<i>Rorippa amphibia</i>	Great Yellow-cress	Axiophyte
<i>Rumex conglomeratus</i>	Clustered Dock	
<i>Rumex crispus</i>	Curled Dock	
<i>Rumex hydrolapathum</i>	Water Dock	Axiophyte
<i>Sagittaria sagittifolia</i>	Arrowhead	Axiophyte
<i>Salix cinerea</i>	Grey Willow	Axiophyte
<i>Scirpus/Schoenopectus lacustris</i>	Common Club-rush	
<i>Scrophularia aquatica</i>	Water Figwort	Axiophyte
<i>Scutellaria galericulata</i>	Skullcap	
<i>Solanum dulcamara</i>	Bittersweet	Axiophyte
<i>Sparganium emersum</i>	Unbranched Bur-reed	
<i>Sparganium erectum</i>	Branched Bur-reed	
<i>Stachys palustris</i>	Marsh Woundwort	Axiophyte
<i>Stellaria alsine</i>	Bog Stitchwort	UKBAP, Axiophyte
<i>Stellaria palustris</i>	Marsh Stitchwort	
<i>Stratiotes aloides</i>	Water Soldier	Axiophyte
<i>Symphytum officinale</i>	Common Comfrey	Axiophyte
<i>Typha angustifolia</i>	Lesser Reedmace	Axiophyte
<i>Typha latifolia</i>	Greater Reedmace	
<i>Valeriana dioica</i>	Marsh Valerian	Axiophyte
<i>Veronica beccabunga</i>	Brooklime	Axiophyte
<i>Veronica catenata</i>	Pink Water-speedwell	
<i>Veronica scutellata</i>	Marsh Speedwell	Axiophyte
<i>Zannichellia palustris</i>	Horned Pondweed	Axiophyte

Lowland dry-acidic grassland

The UK BAP describes Lowland acid grassland as typically occurring on nutrient-poor, generally free-draining soils with pH ranging from 4 to 5.5 overlying acid rocks or superficial deposits such as sands and gravels.

National Vegetation Classification communities associated with lowland dry acidic grassland include U1 (*Festuca ovina* - *Agrostis capillaris* - *Rumex acetosella*), U2 (*Deschampsia* grassland), U4 (*Festuca ovina* - *Agrostis capillaris* - *Galium saxatile*).

Definition of lowland acid grassland can be problematical but here it is defined as both enclosed and unenclosed acid grassland throughout the UK lowlands (normally below c. 300m/980ft). It covers all acid grassland managed in functional enclosures; swards in old and non-functional enclosures in the upland fringes, which are managed as free-range rough grazing in association with unenclosed tracts of upland, are excluded.

It often occurs as an integral part of lowland heath landscapes, in parklands and locally on coastal cliffs and shingle. It is normally managed as pasture. Acid grassland is characterised by a range of plant species such as Heath Bedstraw (*Galium saxatile*), Sheep's Fescue (*Festuca ovina*), Common Bent (*Agrostis capillaris*), Sheep's Sorrel (*Rumex acetosella*), Wavy Hair-Grass (*Deschampsia flexuosa*), Bristle Bent (*Agrostis curtisii*) and Tormentil (*Potentilla erecta*), with presence and abundance depending on community type and locality. Dwarf shrubs such as Heather (*Calluna vulgaris*) and Bilberry (*Vaccinium myrtillus*) can also occur but at low abundance. Lowland acid grassland often forms a mosaic with dwarf shrub heath.

Acid grasslands can have a high cover of bryophytes and parched acid grassland can be rich in lichens. Acid grassland is very variable in terms of species richness and stands can range from relatively species-poor (less than 5 species per 4m²) to species-rich (in excess of 25 species per 4m²). Parched acid grassland in particular contains a significant number of rare and scarce vascular plant species many of which are annuals. These include species such as Mossy Stonecrop (*Crassula tillaea*), Smooth Rupturewort (*Herniaria glabra*), Slender Bird's-Foot-Trefoil (*Lotus angustissimus*), Bur Medick (*Medicago minima*) and Clustered Clover (*Trifolium glomeratum*) and Spring Speedwell (*Veronica verna*). Perennial taxa associated with these grasslands include, Sticky Catchfly (*Lychnis viscaria*) and Shaggy Mouse-Ear-Hawkweed (*Pilosella peleteriana*).

The bird fauna of acid grassland is very similar to that of other lowland dry grasslands which collectively are considered to be a priority habitat for conservation action. Bird species of conservation concern which utilise acid grassland for breeding or wintering include woodlark (*Lullula arborea*), Stone curlew (*Burhinus oedicephalus*), nightjar (*Caprimulgus europaeus*), lapwing, skylark, Green woodpecker (*Picus viridis*), Hen harrier (*Circus cyaneus*) and merlin (*Falco columbarius*). Many of the invertebrates that occur in acid grassland are specialist species which do not occur in other types of grassland. The open parched acid grasslands on sandy soils in particular, can support a considerable number of ground-dwelling and burrowing invertebrates such as solitary bees and wasps. A number of rare and scarce species are associated

with the habitat, some of which are included on the UK Biodiversity Action Plan list of species of conservation concern, such as the Field-cricket (*Gryllus campestris*). As with other lowland semi-natural grassland types, acid grassland has undergone substantial decline in the 20th century, this decline is mostly due to agricultural intensification.

The UKBAP list the following factors as affecting Lowland Dry-acidic Grassland and leading to increasing fragmentation of this habitat;

- Agricultural intensification by use of fertilisers, herbicides and other pesticide, liming, re-seeding or ploughing for arable crops.
- Agricultural and other management neglect leading to rank over-growth, and bracken (*Pteridium aquilinum*) and scrub encroachment.
- Over-grazing is a more localised problem, and is sometimes associated with supplementary feeding which can cause localised sward damage.
- Afforestation particularly with softwoods on light sandy soils.
- Development activities such as mineral and rock extraction, road building, housing and landfill.
- Atmospheric pollution and climate change, the influence of which is not fully assessed.

For Barnsley Lowland Dry-acidic grassland should be selected as local wildlife sites if they meet any of the following criteria

1. Any site ≥ 0.5 ha that has an affinity with NVC communities U1, U2 and U4
2. Satisfies the site selection criteria for fauna
3. Any site ≥ 0.5 ha that scores **15+** from Table 1.8 dry acid grassland

Species marked in **bold** score 2, these are UKBAP and/or Axiophytes, other species score 1

Table 1.8 Lowland dry-acidic grassland species table

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Agrostis canina</i> sens.lat.	Velvet Bent	Axiophyte
<i>Agrostis capillaris</i>	Common Bent	
<i>Agrostis stolonifera</i>	Creeping Bent	
<i>Aira praecox</i>	Early Hair-grass	
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	
<i>Arenaria serpyllifolia</i>	Thyme-leaved Sandwort	
<i>Blechnum spicant</i>	Hard Fern	
<i>Calluna vulgaris</i>	Heather	
<i>Campanula rotundifolia</i>	Harebell	
<i>Carex arenaria</i>	Sand Sedge	
<i>Carex echinata</i>	Star Sedge	
<i>Carex nigra</i>	Common Sedge	

<i>Carex panicea</i>	Carnation Sedge	
<i>Carex pilulifera</i>	Pill Sedge	Axiophyte
<i>Conopodium majus</i>	Pignut	
<i>Danthonia decumbens</i>	Heath Grass	Axiophyte
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	
<i>Deschampsia flexuosa</i>	Wavy Hair-grass	
<i>Empetrum nigrum subsp.nigrum</i>	Crowberry	
<i>Erica cinerea</i>	Bell Heather	Axiophyte
<i>Eriophorum vaginatum</i>	Hare's-tail Cottongrass	
<i>Festuca ovina</i>	Sheep's Fescue	
<i>Filago minima</i>	Small Cudweed	Axiophyte
<i>Galium saxatile</i>	Heath Bedstraw	
<i>Hieracium pilosella</i>	Mouse-eared Hawkbit	
<i>Holcus lanatus</i>	Yorkshire Fog	
<i>Holcus mollis</i>	Creeping Soft-grass	
<i>Hypochaeris radicata</i>	Common Cat's-ear	
<i>Juncus effusus</i>	Soft Rush	
<i>Juncus squarrosus</i>	Heath Rush	
<i>Lathyrus linifolius</i>	Bitter Vetch	Axiophyte
<i>Leontodon/saxatilis</i>	Lesser Hawkbit	Axiophyte
<i>Lotus corniculatus</i>	Common Bird's-foot Trefoil	
<i>Luzula multiflora</i>	Heath Wood-rush	
<i>Luzula sylvatica</i>	Great Wood-rush	
<i>Molinia caerulea</i>	Purple Moor-grass	
<i>Nardus stricta</i>	Mat grass	
<i>Ornithopus perpusillus</i>	Bird's-foot	Axiophyte
<i>Polygala serpyllifolia</i>	Heath Milkwort	
<i>Potentilla erecta</i>	Tormentil	Axiophyte
<i>Rumex acetosella</i>	Sheep's Sorrel	
<i>Succisa pratensis</i>	Devil's-bit Scabious	Axiophyte
<i>Teucrium scorodonia</i>	Wood Sage	
<i>Ulex gallii</i>	Western Gorse	Axiophyte
<i>Vaccinium myrtillus</i>	Bilberry	
<i>Veronica officinalis</i>	Heath Speedwell	Axiophyte
<i>Viola palustris</i>	Marsh Violet	Axiophyte
<i>Viola riviniana</i>	Dog Violet	

Lowland Meadows

Lowland meadows include most forms of unimproved neutral grassland in the enclosed lowland landscapes of the United Kingdom. They tend to contain the National Vegetation Classifications of MG4 (*Alopecurus pratensis* – *Sanguisorba officinalis* grassland), MG5 (*Cynosurus cristatus* – *Centaurea nigra* grassland – *Centaureo* - *Cynosuretum cristati*) and MG8 (*Cynosurus cristatus* – *Caltha palustris* flood pasture grassland).

The UKBAP plan is not restricted to grasslands cut for hay, but also takes into account unimproved neutral pastures where livestock grazing is the main land use. On many farms in different parts of the UK, use of particular fields for grazing pasture and hay cropping changes over time, but the characteristic plant community may persist with subtle changes in floristic composition.

The UKBAP plan concentrates on meadows and pastures associated with low-input nutrient regimes, and cover the major forms of neutral grassland which have a specialist group of scarce and declining plant species. Among flowering plants, these include fritillary (*Fritillaria meleagris*), dyer's greenweed (*Genista tinctoria*), green-winged orchid (*Orchis morio*), greater butterfly orchid *Platanthera chlorantha*, pepper saxifrage (*Silaum silaus*) and wood bitter vetch (*Vicia orobus*). Lowland meadows and pastures are important habitats for skylark and a number of other farmland birds, notably the corncrake (*Crex crex*) which has experienced a major range contraction and decline across the UK.

The UKBAP list the following factors as threatening the biodiversity value of lowland meadows;

- Agricultural improvement through, drainage, ploughing, re-seeding, fertiliser treatment, slurry application, conversion to arable and a shift from hay-making to silage production.
- Decline in the perceived agricultural value of species-rich pasture and hay in farming regimes.
- Abandonment leading to rank over-growth, and bracken (*Pteridium aquilinum*) and scrub encroachment.
- Supplementary stock feeding, associated with increased stocking levels, which can lead to eutrophication as well as localised poaching.
- Application of herbicides and other pesticides.
- Atmospheric pollution and climate change, the influence of which is not fully assessed.
- Reduced inundation frequency and duration, in water-meadows and floodplain grasslands associated with abandoned irrigation schemes, and lowered water tables as a result of land drainage, flood alleviation engineering, surface and ground water abstraction, floodplain gravel extraction and other activities.
- Floristic impoverishment due to heavy grazing pressure and changes in stock species and breeds.

Lowland meadows will be considered for wildlife site selection if they meet any of the following criteria;

1. Any site ≥ 0.5 ha that has an affinity to National Vegetation Classifications MG4, MG5 and MG8
2. Satisfies the site selection criteria for fauna
3. Any site ≥ 0.5 ha that scores **15+** from Table 1.9 lowland meadows species list

Species marked in **bold** score 2, these are UKBAP and/or Axiophytes, other species score 1

Table 1.9 Lowland meadows species table

SPECIES	COMMON NAME	ATTRIBUTES
<i>Achillea millefolium</i>	Yarrow	
<i>Achillea ptarmica</i>	Sneezewort	
<i>Agrimonia eupatoria</i>	Agrimony	Axiophyte
<i>Alchemilla glabra</i>	Smooth Lady's-mantle	
<i>Alchemilla vestita</i>	A Lady's Mantle	
<i>Alchemilla xanthochlora</i>	A Lady's Mantle	
<i>Alopecurus pratensis</i>	Meadow Foxtail	
<i>Avenula pubescens</i>	Downy Oat-grass	Axiophyte
<i>Briza media</i>	Quaking Grass	Axiophyte
<i>Cardamine pratensis</i>	Cuckoo Flower/Lady's Smock	Axiophyte
<i>Carex demissa/viridula subsp oedocarpa</i>	Common Yellow Sedge	
<i>Carex flacca</i>	Glaucous Sedge	
<i>Carex hirta</i>	Hairy Sedge	
<i>Carex nigra</i>	Common Sedge	
<i>Centaurea nigra</i> agg.	Common Knapweed	
<i>Colchicum autumnale</i>	Meadow Saffron	Axiophyte
<i>Conopodium majus</i>	Pignut	
<i>Crepis capillaris</i>	Smooth Hawk's-beard	
<i>Crepis paludosa</i>	Marsh Hawk's-beard	Axiophyte
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	
<i>Euphrasia nemorosa</i>	Common Eyebright	
<i>Festuca arundinacea</i>	Tall Fescue	
<i>Festuca pratensis</i>	Meadow Fescue	
<i>Festuca rubra</i> agg.	Red Fescue	
<i>Filipendula ulmaria</i>	Meadowsweet	
<i>Galium verum</i>	Lady's Bedstraw	Axiophyte
<i>Knautia arvensis</i>	Field Scabious	
<i>Lathyrus pratensis</i>	Meadow Vetchling	
<i>Leontodon autumnalis</i>	Autumn Hawkbit	
<i>Leontodon hispidus</i>	Rough Hawkbit	Axiophyte
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	
<i>Lotus corniculatus</i>	Common Bird's-foot Trefoil	
<i>Lotus uliginosus/pendunculatus</i>	Greater Bird's-foot Trefoil	
<i>Luzula campestris</i>	Field Wood Rush	
<i>Lychnis flos-cuculi</i>	Ragged Robin	Axiophyte
<i>Ophioglossum vulgatum</i>	Adder's Tongue	Axiophyte
<i>Pimpinella saxifraga</i>	Burnet-saxifrage	Axiophyte
<i>Plantago media</i>	Hoary Plantain	Axiophyte
<i>Primula veris</i>	Cowslip	Axiophyte
<i>Prunella vulgaris</i>	Selfheal	
<i>Ranunculus acris</i>	Meadow Buttercup	
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	
<i>Ranunculus repens</i>	Creeping Buttercup	
<i>Rhinanthus minor</i> agg.	Yellow Rattle	Axiophyte
<i>Sanguisorba officinalis</i>	Great Burnet	Axiophyte
<i>Betonica officinalis</i>	Betony	Axiophyte
<i>Succisa pratensis</i>	Devil's-bit Scabious	Axiophyte
<i>Thalictrum flavum</i>	Common Meadow-rue	Axiophyte
<i>Trisetum flavescens</i>	Yellow Oat-grass	Axiophyte
<i>Valeriana dioica</i>	Marsh Valerian	Axiophyte

Floodplain and Grazing Marsh

The UKBAP describes Floodplain and Grazing Marsh as periodically inundated pasture, or meadow with ditches which maintain the water levels, containing standing fresh water.

The ditches are especially rich in plants and invertebrates. Almost all areas are grazed and some are cut for hay or silage. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds; although they may abut with fen and reed/swamp communities.

Grazing marshes are particularly important for the number of breeding waders such as snipe (*Gallinago Gallinago*), lapwing (*Vanellus vanellus*) and curlew *Numenius arquata* they support. Internationally important populations of wintering wildfowl also occur including Bewick swans (*Cygnus bewickii*) and whooper swans (*Cygnus cygnus*).

The UKBAP list the following factors as affecting Floodplain and Grazing Marsh in the UK;

- Ecologically insensitive flood defence works constructed in the past.
- Agricultural intensification.
- Neglect in the form of a decline in traditional management.
- Eutrophication
- Groundwater abstraction.
- Pollution of groundwater or surface water.
- Aggregate extraction.

Sites will be considered for wildlife site selection if they meet any of the following criteria;

1. Satisfies the site selection criteria for fauna
2. Any site ≥ 0.5 ha that scores **18**+ from Table 1.10 floodplain and grazing marsh species list

Species marked in **bold** score 2, these are UKBAP and/or Axiophytes, other species score 1

Table 1.10 Floodplain and Grazing Marsh Species Table

SPECIES	COMMON NAME	ATTRIBUTES
<i>Achillea ptarmica</i>	Sneezewort	
<i>Agrimonia eupatoria</i>	Agrimony	
<i>Alchemilla glabra</i>	Smooth Lady's Mantle	
<i>Alchemilla xanthochlora</i>	Lady's Mantle	
<i>Alisma plantago-aquatica</i>	Water Plantain	

<i>Alnus glutinosa</i>	Alder	
<i>Alopecurus geniculatus</i>	Marsh Foxtail	
Anagallis tenella	Bog Pimpernel	Axiophyte
<i>Atriplex prostrata</i>	Spear-leaved Orache	
Avenula pubescens	Downy Oat-grass	Axiophyte
Betonica officinalis	Betony	Axiophyte
<i>Callitriche stagnalis</i> sens.lat	Common Water Starwort	
Caltha palustris	Marsh Marigold	Axiophyte
<i>Cardamine pratensis</i>	Lady's Smock/Cuckoo Flower	Axiophyte
Carex acuta	Slender Tufted-sedge	Axiophyte
<i>Carex acutiformis</i>	Lesser Pond-sedge	
Carex disticha	Brown Sedge	Axiophyte
<i>Carex flacca</i>	Glaucous Sedge	
<i>Carex hirta</i>	Hairy Sedge	
<i>Carex nigra</i>	Common Sedge	
<i>Carex otrubae</i>	False Fox-sedge	
Carex paniculata	Greater Tussock-sedge	Axiophyte
Carex riparia	Greater Pond-sedge	Axiophyte
Cirsium dissectum	Meadow thistle	Axiophyte
<i>Cirsium palustre</i>	Marsh Thistle	
Crepis paludosa	Marsh Hawksbeard	Axiophyte
<i>Dactylorhiza fuchsii</i>	Common Spotted Orchid	
Dactylorhiza incarnata	Early Marsh-orchid	Axiophyte
Dactylorhiza praetermissa	Southern Marsh-orchid	Axiophyte
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	
<i>Eleocharis palustris</i>	Common Spike-rush	
<i>Epilobium palustre</i>	Marsh Willowherb	
<i>Epipactis palustris</i>	Marsh Helleborine	
<i>Equisetum palustre</i>	Marsh Horsetail	
<i>Euphrasia nemorosa</i>	Eyebright	
<i>Filipendula ulmaria</i>	Meadowsweet	
<i>Galium palustre</i> sens.lat.	Common Marsh-bedstraw	
Galium uliginosum	Fen Bedstraw	Axiophyte
Galium verum	Lady's Bedstraw	Axiophyte
<i>Geum rivale</i>	Water Avens	
<i>Glyceria declinata</i>	Small Sweet-grass	
<i>Glyceria fluitans</i>	Floating Sweet-grass	
<i>Glyceria maxima</i>	Reed Sweet-grass	
Hydrocotyle vulgaris	Marsh Pennywort	Axiophyte
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort	
<i>Iris pseudacorus</i>	Yellow Flag/Yellow Iris	
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	
<i>Juncus articulatus</i>	Jointed Rush	
<i>Juncus bufonius</i> sens.lat.	Toad Rush	
<i>Juncus conglomeratus</i>	Compact Rush	
<i>Juncus effusus</i>	Soft Rush	
<i>Juncus inflexus</i>	Hard Rush	
Juncus subnodulosus	Blunt-flowered Rush	Axiophyte
<i>Lathyrus pratensis</i>	Meadow Vetchling	
<i>Lotus pendunculatus</i>	Greater Bird's-foot Trefoil	
Lychnis flos-cuculi	Ragged Robin	Axiophyte
<i>Lycopus europaeus</i>	Gipsywort	

<i>Lysimachia vulgaris</i>	Yellow Loosestrife	Axiophyte
<i>Lythrum salicaria</i>	Purple Loosestrife	Axiophyte
<i>Mentha aquatica</i>	Water Mint	
<i>Myosotis laxa</i>	Tufted Forget-me-not	
<i>Myosotis scorpioides</i>	Water Forget-me-not	
<i>Persicaria amphibia</i>	Amphibious Bistort	
<i>Phragmites australis</i>	Southern Phragmites	
<i>Potentilla anserina</i>	Silverweed	
<i>Primula veris</i>	Cowslip	Axiophyte
<i>Pulicaria dysenterica</i>	Common Fleabane	Axiophyte
<i>Ranunculus acris</i>	Meadow Buttercup	
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	
<i>Ranunculus sceleratus</i>	Celery-leaved Buttercup	Axiophyte
<i>Rhinanthus minor</i> agg.	Yellow Rattle	Axiophyte
<i>Rumex conglomeratus</i>	Clustered Dock	
<i>Sanguisorba officinalis</i>	Great Burnet	Axiophyte
<i>Schedonorus arundinacea</i>	Tall Fescue	
<i>Schedonorus pratensis</i>	Meadow Fescue	
<i>Schoenus nigricans</i>	Black Bog-rush	Axiophyte
<i>Scrophularia auriculata</i>	Water Figwort	
<i>Scutellaria galericulata</i>	Skullcap	Axiophyte
<i>Scutellaria minor</i>	Lesser Skullcap	Axiophyte
<i>Senecio aquaticus</i>	Marsh Ragwort	Axiophyte
<i>Solanum dulcamara</i>	Bittersweet	
<i>Sparganium erectum</i>	Branched Bur-weed	
<i>Stellaria alsine</i>	Bog Stichwort	
<i>Stellaria neglecta</i>	Greater Chickweed	Axiophyte
<i>Stellaria palustris</i>	Marsh Stitchwort	UKBAP, Axiophyte
<i>Succisa pratensis</i>	Devil's Bit Scabious	Axiophyte
<i>Symphytum officinale</i>	Comfrey	Axiophyte
<i>Thalictrum flavum</i>	Common Meadow-rue	Axiophyte
<i>Trisetum flavescens</i>	Yellow Oat Grass	Axiophyte
<i>Valeriana dioica</i>	Marsh Valerian	Axiophyte
<i>Valeriana officinalis</i>	Valerian	
<i>Veronica beccabunga</i>	Brooklime	

Arable Field Margins

The UKBAP refers Arable/Cereal Field Margins as strips of land lying between cereal/arable crops and the field boundary, and extending for a limited distance into the crop, which are deliberately managed to create conditions which benefit key farmland species. They can take a variety of forms, the principal types being:

- A 'Wildlife Strip' 6m wide adjacent to a cereal crop, together with a 1 m 'Sterile Strip' between the wildlife strip and the crop. The wildlife strip is cultivated once a year but not cropped; the Sterile Strip is maintained so as to prevent aggressive arable weeds spreading into the adjacent cereal crop.
- A 'Conservation Headland' either 6m or 12m wide forming the outer margin of the crop and separated from an adjacent field boundary or other

vegetation by a 1 m Sterile Strip. The Conservation Headland is cropped with cereals but is managed with reduced inputs of pesticides so as to favour wild arable plants and invertebrates.

- A combined wildlife strip and Conservation Headland separated by a Sterile Strip and managed as described as above.
- Game crops, stubble or grassland fallows lying between annually cropped land and the field boundary.

Arable/cereal field margins are important habitat for Grey Partridge, Yellowhammer and many invertebrate species.

Arable field margins will be considered as local wildlife sites if they meet the following criteria

1. Any site $\geq 50\text{m}$ in length and $\geq 6\text{m}$ wide that scores **15+** from Arable/cereal field margins Table 1.11
2. Satisfies the site selection criteria for fauna

Species marked in **bold** score 2, these are UKBAP and or Axiophytes, other species score 1.

Table 1.11 Arable Field Margin Species Table

SPECIES	COMMON NAME	ATTRIBUTES
<i>Aethusa cynapium</i>	Fool's Parsley	
<i>Alopecurus myosuroides</i>	Blackgrass	
Anagallis arvensis	Scarlet Pimpernel	Axiophyte
Anchusa arvensis	Bugloss	Axiophyte
<i>Anisantha sterilis</i>	Barren Brome	
Anthemis arvensis	Corn chamomile	Axiophyte
<i>Anthemis cotula</i>	Stinking Chamomile	
<i>Aphanes arvensis</i>	Parsley Piert	
<i>Arabidopsis thaliana</i>	Thale Cress	
Arenaria serpyllifolia	Thyme-leaved Sandwort	Axiophyte
<i>Atriplex patula</i>	Common Orache	
<i>Atriplex prostrata</i>	Spear-leaved Orache	
<i>Avena fatua</i>	Common Wild-oat	
<i>Bellis perennis</i>	Daisy	
<i>Brassica napus</i>	Rape	
<i>Brassica rapa</i>	Turnip	
<i>Calystegia sepium</i>	Hedge Bindweed	
<i>Capsella bursa-pastoris</i>	Shepherd's Purse	
<i>Cerastium glomeratum</i>	Sticky Mouse-ear	
<i>Chamerion angustifolium</i>	Rosebay Willowherb	
<i>Chenopodium album</i>	Fat Hen	
<i>Chenopodium bonus-henricus</i>	Good King Henry	
<i>Chenopodium rubrum</i>	Red Goosefoot	
Chrysanthemum segetum	Corn Marigold	Axiophyte
<i>Convolvulus arvensis</i>	Field Bindweed	
<i>Coronopus didymus</i>	Lesser Swine-cress	

<i>Coronopus squamatus</i>	Swine-cress	Axiophyte
<i>Daucus carota</i>	Wild carrot	
<i>Descurainia sophia</i>	Flixweed	
<i>Diplotaxis muralis</i>	Annual Wall-rocket	
<i>Erodium cicutarium</i>	Common Stork's-bill	
<i>Erophila verna</i>	Common Whitlow-grass	
<i>Euphorbia helioscopia</i>	Sun Spurge	
<i>Euphorbia peplus</i>	Petty Spurge	
<i>Fumaria muralis</i>	Common Ramping- fumitory	
<i>Fumaria officinalis</i>	Common Fumitory	
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	
<i>Geranium dissectum</i>	Cut-leaved Crane's-bill	
<i>Geranium molle</i>	Dove's-foot Crane's-bill	
<i>Hordeum vulgare</i>	Six-rowed Barley	
<i>Lamium amplexicaule</i>	Henbit Dead-nettle	Axiophyte
<i>Lamium hybridum</i>	Cut-leaved Dead-nettle	
<i>Lamium purpureum</i>	Red Dead-nettle	Axiophyte
<i>Lapsana communis</i>	Nipplewort	
<i>Myosotis arvensis</i>	Forget-me-not	
<i>Papaver dubium</i>	Long-headed Poppy	
<i>Papaver rhoeas</i>	Corn Poppy	
<i>Polygonum arenastrum</i>	Equal-leaved Knotgrass	
<i>Polygonum aviculare</i>	Knotgrass	
<i>Potentilla anserina</i>	Silverweed	
<i>Ranunculus arvensis</i>	Corn Buttercup	
<i>Raphanus raphanistrum</i>	Wild Radish	
<i>Senecio vulgaris</i>	Groundsel	
<i>Sherardia arvensis</i>	Field Madder	
<i>Sinapis arvensis</i>	Charlock	
<i>Sisymbrium officinale</i>	Hedge Mustard	
<i>Solanum nigrum</i>	Black Nightshade	
<i>Sonchus arvensis</i>	Perennial Sow-Thistle	
<i>Sonchus asper</i>	Prickly Sow-Thistle	
<i>Sonchus oleraceus</i>	Smooth Sow-Thistle	
<i>Spergula arvensis</i>	Corn Spurrey	
<i>Stellaria media agg.</i>	Common Chickweed	
<i>Thlaspi arvense</i>	Field Penny-cress	
<i>Urtica urens</i>	Small Nettle	
<i>Valerianella locusta</i>	Common Cornsalad	
<i>Veronica agrestis</i>	Green Field-speedwell	
<i>Veronica arvensis</i>	Wall Speedwell	
<i>Veronica persica</i>	Common Field-speedwell	
<i>Veronica polita</i>	Grey Field-speedwell	
<i>Vicia sativa</i>	Common Vetch	
<i>Viola arvensis</i>	Field Pansy	

Hedgerows

Hedgerows are important elements within our landscape; they not only provide us with a historical record of land-use but also an important biodiversity resource and corridors for wildlife. The number of species within hedges is more often than not a good indicator of its age, this is known as Hooper's Rule⁵, it is only a rule of thumb and there are certain geographic exceptions.

1. Any hedgerow $\geq 20\text{m}$ in length and $< 5\text{m}$ in width that includes at least **4** or more woody species such as Hawthorn (*Crataegus monogyna*) or Blackthorn (*Prunus spinosa*) from the Woody Hedgerow Species list (Table 1.12) and scores **6** from the Non-Woody Hedgerow Species List (Table 1.13).
2. Any hedgerow that connects a Priority habitat to another Priority habitat and contains **4** or more woody species
3. Satisfies the site selection criteria for fauna

Species marked in **bold** score 2, these are UKBAP and or Axiophytes, all other species score 1.

Table 1.12 Woody Hedgerow Species⁶

SPECIES	COMMON NAME	ATTRIBUTES
<i>Acer campestre</i>	Field Maple	
<i>Betula pendula</i>	Silver Birch	
<i>Betula pubescens</i>	Downy Birch	
<i>Alnus glutinosa</i>	Alder	
<i>Carpinus betulus</i>	Hornbeam	Axiophyte
<i>Cornus sanguinea</i>	Dogwood	
<i>Corylus avellana</i>	Hazel	
<i>Crataegus laevigata</i>	Midland Hawthorn	Axiophyte
<i>Crataegus monogyna</i>	Hawthorn	
<i>Cytisus scoparius</i>	Broom	
<i>Daphne laureola</i>	Spurge-laurel	
<i>Daphne mezereum</i>	Mezereon	
<i>Euonymus europaeus</i>	Spindle	Axiophyte
<i>Fagus sylvatica</i>	Beech	
<i>Fraxinus excelsior</i>	Ash	
<i>Ilex aquifolium</i>	Holly	
<i>Ligustrum vulgare</i>	Wild Privet	
<i>Malus sylvestris</i>	Crab Apple	
<i>Prunus avium</i>	Wild Cherry	Axiophyte
<i>Prunus padus</i>	Bird Cherry	Axiophyte
<i>Prunus spinosa</i>	Blackthorn	
<i>Quercus robur</i>	English Oak	
<i>Rhamnus catharticus</i>	Purging Buckthorn	Axiophyte
<i>Rosa arvensis</i>	Field Rose	

⁵ The History of the Countryside – The classic history of Britain's landscape, flora and fauna, (1986) Oliver Rackham

⁶ Adapted from 1997 Hedgerow Regulations

<i>Rosa canina</i>	Dog Rose	Axiophyte	
<i>Salix spp</i>	Willow spp		
<i>Sambucus nigra</i>	Elder		
<i>Sorbus aria</i>	Common Whitebeam		
<i>Sorbus aucuparia</i>	Rowan		
<i>Sorbus torminalis</i>	Wild-service Tree		
<i>Taxus baccata</i>	Yew		
<i>Tilia cordata</i>	Small-leaved Lime		
<i>Tilia platyphyllos</i>	Large-leaved Lime		
<i>Ulmus glabra</i>	Wych Elm		
<i>Ulex europaea</i>	Gorse		
<i>Ulmus procera</i>	English Elm		
<i>Viburnum lantana</i>	Wayfaring Tree		Axiophyte
<i>Viburnum opulus</i>	Guelder Rose		

Table 1.13 Non-Woody Hedgerow Species

SPECIES	COMMON NAME	ATTRIBUTES	
<i>Allium ursinum</i>	Ramsons	Axiophyte	
<i>Anemone nemorosa</i>	Wood Anemone		
<i>Arum maculatum</i>	Lords-and Ladies		
<i>Brachypodium sylvaticum</i>	False-brome		
<i>Bromopsis erecta</i>	Upright Brome		Axiophyte
<i>Calystegia sepium</i>	Hedge Bindweed		
<i>Circaea lutetiana</i>	Enchanter's-nightshade		
<i>Clematis vitalba</i>	Old Man's Beard		
<i>Digitalis purpurea</i>	Foxglove		
<i>Dryopteris affinis</i>	Scaly Male-fern		
<i>Dryopteris filix-mas</i>	Male-fern		
<i>Fragaria vesca</i>	Wild Strawberry		
<i>Geranium robertianum</i>	Herb-Robert		
<i>Geum urbanum</i>	Wood Avens		
<i>Glechoma hederacea</i>	Ground-ivy		Axiophyte
<i>Hedera helix</i>	Ivy		
<i>Holcus mollis</i>	Creeping Soft-grass		
<i>Hyacinthoides non-scripta</i>	Bluebell		
<i>Lonicera periclymenum</i>	Honeysuckle		
<i>Mercurialis perennis</i>	Dog's Mercury		
<i>Moehringia trinervia</i>	Three-nerved Sandwort		
<i>Oxalis acetosella</i>	Wood-sorrel		
<i>Phyllitis scolopendrium</i>	Hart's Tongue Fern		
<i>Primula vulgaris</i>	Primrose	Axiophyte	
<i>Ranunculus repens</i>	Creeping Buttercup		
<i>Rhamnus catharticus</i>	Purging Buckthorn	Axiophyte	
<i>Rumex sanguineus</i>	Blood-veined Dock		
<i>Silene dioica</i>	Red Campion		
<i>Stachys sylvatica</i>	Hedge Woundwort		
<i>Stellaria graminea</i>	Lesser Stitchwort		
<i>Stellaria holostea</i>	Greater Stitchwort		
<i>Tamus communis</i>	Black bryony	Axiophyte	
<i>Teucrium scorodonia</i>	Wood Sage		
<i>Torilis japonica</i>	Upright Hedge parsley		

<i>Veronica chamaedrys</i>	Germander Speedwell	Axiophyte
<i>Veronica officinalis</i>	Heath Speedwell	
<i>Viola riviniana</i>	Common Dog Violet	

Blanket Bog

The following definition is taken from the UKBAP. The term blanket 'bog' strictly applies only to that portion of a blanket 'mire' which is exclusively rain-fed. However, for the purposes of the UKBAP the terms 'bog' and 'mire' will be regarded as more or less synonymous.

Blanket bog is a globally restricted peatland habitat confined to cool, wet, typically oceanic climates. It is, however, one of the most extensive semi-natural habitats in the UK and ranges from Devon in the south to Shetland in the north.

Peat depth is also very variable, with an average of 0.5-3 m being fairly typical but depths in excess of 5 m not unusual. There is no agreed minimum depth of peat which can support blanket bog vegetation. It includes the EC Habitats Directive priority habitat 'active' blanket bog, the definition of active being given as 'still supporting a significant area of vegetation that is normally peat forming'.

Although most widespread in the wetter west and north, blanket bog also occurs in eastern upland areas. Blanket bog peat accumulates in response to the very slow rate at which plant material decomposes under conditions of water-logging. It is not, however, confined to areas of poor drainage but rather can cloak whole landscapes, even developing on slopes of up to 30°.

Studies indicate that most blanket peat development began 5000-6000 years ago, but the range extends from 9000 - 1500 years ago. There is evidence to suggest that some areas of blanket bog began to form following clearance of the original forest cover by early man, but the relative significance of this activity and changing climate on the historical and contemporary extent of the resource has yet to be determined.

National Vegetation Communities (NVC) associated with Blanket bog in the Barnsley are M3 (*Eriophorum angustifolium* bog pool community), M19 (*Calluna vulgaris* – *Eriophorum vaginatum* blanket mire), M20 (*Eriophorum vaginatum* blanket mire) and M25 (*Molinia caerulea* – *Potentilla erecta* mire), together with their intermediates. Other communities, such as flush, fen and swamp types, also form an integral part of the blanket bog landscape.

Many of the typical blanket mire species, such as heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, deer grass, cotton grass species and several of the bog moss *Sphagnum* species, occur throughout much of the range of the habitat, although their relative proportions vary across the country. Thus criteria for the assessment of habitat condition based on species assemblage and relative abundance must be determined locally.

Blanket bog sites will be considered for local wildlife site selection if they meet the following criteria;

1. Sites over 0.25ha on peat substrate >0.5m deep that have an affinity with National Vegetation Classifications M3, M19, M20 and M25

2. Satisfies the site selection criteria for fauna

Table 1.14 Species associated with blanket bog

SCIENTIFIC NAME	COMMON NAME	ATTRIBUTES
<i>Achillea ptarmica</i>	Yarrow	
<i>Andromeda polifolia</i>	Bog Rosemary	Axiophyte
<i>Blechnum spicant</i>	Hard Fern	Axiophyte
<i>Calluna vulgaris</i>	Heather	Axiophyte
<i>Carex binervis</i>	Green-ribbed Sedge	
<i>Carex curta</i>	White Sedge	Axiophyte
<i>Carex demissa</i>	Common Yellow Sedge	
<i>Carex echinata</i>	Star Sedge	
<i>Carex nigra</i>	Common Sedge	
<i>Carex panicea</i>	Carnation Sedge	
<i>Carex pilulifera</i>	Pill Sedge	Axiophyte
<i>Carex pulicaris</i>	Flea Sedge	Axiophyte
<i>Cirsium palustre</i>	Marsh Thistle	
<i>Dactylorhiza maculata</i>	Heath Spotted Orchid	Axiophyte
<i>Danthonia decumbens</i>	Heath Grass	Axiophyte
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	
<i>Deschampsia flexuosa</i>	Wavy Hair-grass	
<i>Drosera rotundifolia</i>	Round-leaved Sundew	Axiophyte
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	Axiophyte
<i>Empetrum nigrum subsp.nigrum</i>	Crowberry	
<i>Erica cinerea</i>	Bell Heather	Axiophyte
<i>Erica tetralix</i>	Cross-leaved Heath	Axiophyte
<i>Eriophorum angustifolium</i>	Common Cottongrass	
<i>Eriophorum vaginatum</i>	Hare's-tail Cottongrass	
<i>Galium saxatile</i>	Heath Bedstraw	
<i>Hypericum tetrapterum</i>	Square-stalked St John's Wort	
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	
<i>Juncus articulatus</i>	Jointed Rush	
<i>Juncus bulbosus</i>	Bulbous Rush	
<i>Juncus conglomeratus</i>	Compact Rush	
<i>Juncus effusus</i>	Soft Rush	
<i>Juncus squarrosus</i>	Heath Rush	
<i>Juncus subnodulosus</i>	Blunt-flowered Rush	Axiophyte
<i>Luzula multiflora</i>	Heath Wood-rush	
<i>Menyanthes trifoliata</i>	Bog Bean	Axiophyte
<i>Molinia caerulea</i>	Purple Moor-grass	
<i>Nardus stricta</i>	Mat Grass	
<i>Narthecium ossifragum</i>	Bog asphodel	Axiophyte
<i>Osmunda regalis</i>	Royal Fern	Axiophyte
<i>Pedicularis palustris</i>	Marsh Lousewort	Axiophyte
<i>Pedicularis sylvatica</i>	Lousewort	Axiophyte
<i>Pinguicula vulgaris</i>	Common Butterwort	Axiophyte
<i>Polygala serpyllifolia</i>	Heath Milkwort	

<i>Potamogeton polygonifolius</i>	Bog Pondweed	Axiophyte
<i>Potentilla erecta</i>	Tormentil	Axiophyte
<i>Ranunculus flammula</i>	Lesser Spearwort	
<i>Rubus chamaemorus</i>	Cloudberry	Axiophyte
<i>Scutellaria minor</i>	Lesser Skullcap	Axiophyte
<i>Trichophorum germanicum</i>	Deergrass	Axiophyte
<i>Vaccinium myrtillus</i>	Bilberry	
<i>Vaccinium oxycoccos</i>	Cranberry	Axiophyte
<i>Vaccinium vitis-idaea</i>	Cowberry	Axiophyte
<i>Viola palustris</i>	Marsh Violet	Axiophyte

Habitat Mosaics

There are few sites within Barnsley that are comprised of a single habitat, even large blocks of woodland support open grassland areas, small ponds and scrub. A variety of habitats close together can have a high value for wildlife but using the site scoring criteria may not qualify because of their individual size.

For this reason it is necessary to develop criteria which take into account the combined biodiversity value of mosaic or mixed habitats. Because of the high wildlife value of several habitats close together it is prudent to lower the criteria (for each habitat) to take this into account and ensure habitat assemblages are protected within the local wildlife site system.

Proximity to other sites of high wildlife interest such as Local Wildlife sites and/or LNR/SSSI is also a factor that should be considered as these potentially underscoring sites will still have a stepping stone/connective function within the landscape.

Therefore to take this into account and ensure that landscape connectivity and mosaic habitats are protected within the system the following criteria have been developed in – line with best practice across a number of different Local Wildlife Site Assessment approaches.

Sites will be considered for selection as local wildlife sites if they meet one or more of the following criteria;

1. ≥ 0.5 ha comprising of two or more habitats that satisfy 80% of the criteria for those individual habitats. (For example 0.3ha woodland and 0.3ha lowland heath (0.6ha total) each scoring 80% of their respective criteria.)
2. ≥ 0.5 ha scoring 80% of respective criteria and within 500m of a Local Wildlife Site/SSSI/LNR
3. Satisfies the site selection criteria for fauna

Open Mosaic Habitats on Previously Developed Land

Barnsley's historic legacy of mineral workings has left a landscape rich in successional/pioneer plant communities, these habitats are also important for invertebrates. The criteria set out below are provisional and are those set out in the UKBAP and supported by the work by Defra. Further work is being carried out at the national level to provide a more in-depth/accurate picture of the types of plant and insect communities that can be found on these habitats. These criteria should therefore be re-examined to reflect any changes and recommendations at the national level that may arise in the future.

For a site to be considered as an Open Mosaic Habitat on Previously Developed Land each of the following criteria must be met;

1. The area of open mosaic habitat is at least 0.25ha in size
2. Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrates such as industrial spoil may have been added
3. The site contains some vegetation. This will comprise early successional communities consisting mainly of stress-tolerant (e.g. indicative of low nutrient status or drought) Early successional communities are composed of;
 - a. Annuals, typically;
 - i. Thyme-leaved Sandwort (*Arenaria serpyllifolia*)
 - ii. Common Centaury (*Centaureum erythraea*)
 - iii. Fairy Flax (*Linum catharticum*)
 - iv. Hare's-foot Clover (*Trifolium arvense*)
 - b. Mosses/liverworts, typically
 - i. Ordinary Moss (*Brachythecium rutabulum*)
 - ii. Broom Fork-moss (*Dicranum scoparium*)
 - iii. Cypress-leaved Plait-moss (*Hypnum cupressiforme*)
 - iv. Variable-leaved Crestwort (*Lophocolea heterophylla*)
 - v. Ciliated Fringewort (*Ptilidium ciliare*)
 - c. Lichens, for example
 - i. Foliose (leaf-like)
 - ii. Crustose (crust)
 - iii. Fruticose (shrubby and branched)
 - d. Ruderals, typically
 - i. Carrot (*Daucus carota*)
 - ii. Toadflax (*Linaria vulgaris*)
 - iii. Black Medick (*Medicago lupulina*)
 - iv. Weld (*Reseda luteola*)
 - e. Inundation species, typically
 - i. Marsh Foxtail (*Alopecurus geniculatus*)
 - ii. Toad-rush (*Juncus bufonius*)
 - iii. Redshank (*Persicaria maculosa*)
 - iv. Lesser Spearwort (*Ranunculus flammula*)
 - f. Open grassland, typically
 - i. Sheep's Fescue (*Festuca ovina*)

- ii. Cats-ear (*Hypochaeris radicata*)
 - iii. Mouse-ear Hawkweed (*Pilosella officinarum*)
 - iv. Common Sorrel (*Rumex acetosella*)
 - g. Flower-rich grassland, mature community characterised typically by;
 - i. Common Knapweed (*Centaurea nigra*)
 - ii. Common Bird's-foot Trefoil (*Lotus corniculatus*)
 - iii. Meadow Buttercup (*Ranunculus acris*)
 - iv. Red Clover (*Trifolium pratense*)
 - h. Heathland. typically;
 - i. Heather/Ling (*Calluna vulgaris*)
 - ii. Wavy hair-grass (*Deschampsia flexuosa*)
 - iii. Sheep's Fescue (*Festuca ovina*)
 - iv. Mat Grass (*Nardus stricta*)
4. The site contains un-vegetated, loose bare substrate and pools may be present.
- a. Bare substrate can occur at a range of spatial scales, from un-vegetated patches easily seen at a distance, to small, open spaces between individual plants within a community, for example on coal spoil patches of bare ground may be 10cm or less across
 - b. Bare substrate also implies an absence of accumulated organic matter
5. The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a-h) above plus bare substrate within a 0.25ha area. A mosaic is defined as an area where a range of contiguous plant community types occur in transition with one another, usually with ecotone habitat gradients and repeated occurrences of each community, and often at a small scale. The mosaic could comprise of either;
- a. A mixture of one of the habitats (a-c) or (e-h) plus bare ground together forming a mosaic
 - b. A mixture of two or more of the habitats (a-h) in a mosaic, with adjacent bare ground
 - c. A mixture of two or more habitats (a-h) plus bare ground together forming a mosaic
6. Satisfies the site selection criteria for fauna

The UKBAP also provides a list of Generic species that are characteristic of Open Mosaic Habitats on Previously Developed Land, below is the list for Northern England. This list may also be updated as the research is taken further.

Table 1.15 Species Associated with Open Mosaics on Previously Developed Land

SPECIES	COMMON NAME	ATTRIBUTES
<i>Artemisia vulgaris</i>	Mugwort	Introduced
<i>Aster novi-belgii</i>	Michaelmas Daisy	Introduced
<i>Blackstonia perfoliata</i>	Yellow-wort	
<i>Centaurea nigra</i>	Common Knapweed	
<i>Centaureum erythraea</i>	Common Centaury	

<i>Cerastium fontanum</i>	Common Mouse-ear	Introduced
<i>Cichorium intybus</i>	Chicory	
<i>Conium maculatum</i>	Hemlock	
<i>Crepis biennis</i>	Rough Hawk's-beard	Introduced
<i>Crepis capillaris</i>	Smooth Hawk's-beard	
<i>Dactylorhiza praetermissa</i>	Southern Marsh-orchid	
<i>Daucus carota ssp. sativus</i>	Carrot	
<i>Echium vulgare</i>	Viper's-bugloss	
<i>Equisetum arvense</i>	Field Horsetail	
<i>Erigeron acer</i>	Blue Fleabane	
<i>Euphrasia sp.</i>	Eyebright	
<i>Hieracium sabaudum</i>	Autumn Hawk-weed	
<i>Hypericum perforatum</i>	Perforate St John's-wort	
<i>Hypochaeris radicata</i>	Cat's-ear	Introduced Introduced
<i>Juncus inflexus</i>	Hard Rush	
<i>Linaria repens</i>	Pale Toadflax	
<i>Linaria purpurea</i>	Purple Toadflax	
<i>Linum catharticum</i>	Fairy Flax	
<i>Matricaria matricarioides</i>	Pineapple Weed	
<i>Medicago lupulina</i>	Black Medick	
<i>Melilotus altissimus</i>	Tall Melilot	
<i>Melilotus officinalis</i>	Ribbed Melilot	
<i>Nardus stricta</i>	Mat Grass	
<i>Odontites vernus</i>	Red Bartsia	Introduced
<i>Oenothera sp.</i>	Evening Primrose	
<i>Ophrys apifera</i>	Bee Orchid	
<i>Picris echioides</i>	Bristly Ox-tongue	Introduced
<i>Picris hieracioides</i>	Hawkweed Ox-tongue	
<i>Plantago lanceolata</i>	Ribwort Plantain	Introduced Introduced Introduced
<i>Reseda lutea</i>	Wild Mignonette	
<i>Reseda luteola</i>	Weld	
<i>Saponaria officinalis</i>	Soapwort	
<i>Senecio squalidus</i>	Oxford Ragwort	
<i>Silene vulgaris</i>	Bladder Campion	
<i>Tragopogon pratensis</i>	Goat's-beard	
<i>Trifolium arvense</i>	Hare's-foot Clover	
<i>Trifolium campestre</i>	Hop Trefoil	
<i>Trifolium dubium</i>	Lesser Trefoil	
<i>Trifolium hybridum</i>	Alsike Clover	Introduced
<i>Trifolium medium</i>	Zigzag Clover	
<i>Trifolium pratense</i>	Red Clover	
<i>Trisetum flavescens</i>	Yellow Oat-grass	
<i>Tussilago farfara</i>	Colt's-foot	
<i>Vicia cracca</i>	Tufted Vetch	
<i>Vicia hirsuta</i>	Hairy Tare	

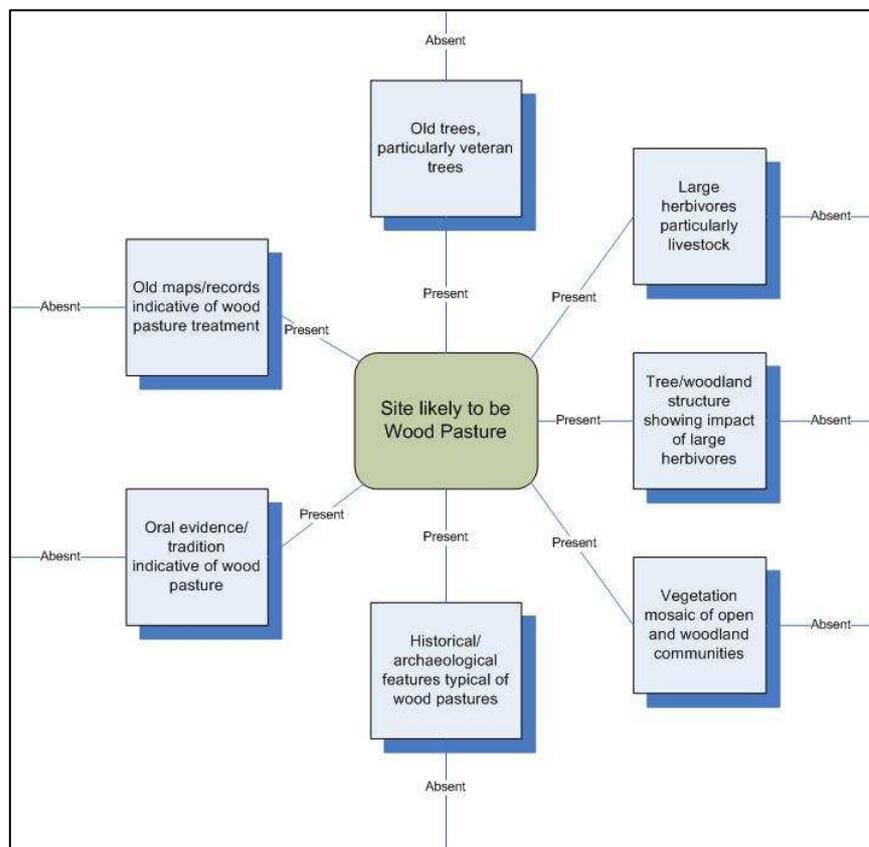
Introduced species of lower biodiversity value, but are still characteristic of this habitat

Wood-Pasture and Parkland

The UKBAP describes wood-pastures as areas that have been managed by a long-established tradition of grazing allowing, where the site is in good condition, the survival of multiple generations of trees, characteristically with at least some veteran trees or shrubs. The tree and shrub component may have been exploited in the past and can occur as scattered individuals, small groups, or as more or less complete canopy cover. Depending on the degree of canopy cover the other semi-natural habitats, including grassland, heath, scrub etc, may occur in mosaic with woodland communities. While oak, beech, alder, birch, ash, hawthorn, hazel or pine are often dominant, a wide range of other tree and shrub species may occur as part of wood-pasture systems.

Wood-pastures and parkland are the products of historic land management systems, and represent a vegetation structure rather than being a particular plant community. Typically this structure consists of large, open-grown or high forest trees (often pollards) at various densities, in a matrix of grazed grassland, heathland and/or woodland floras. They are home to numerous species that are often associated with old/veteran trees such as bats and fungi.

Because wood-pasture and parkland can contain a number of habitats that are associated with a number of National Vegetation Classifications it is difficult to assess a site based on a scoring system based on plant species alone. An assessment based on the structure and historic associations is a more viable method of assessing wood-pasture and parkland. The UKBAP suggests the use of the following diagram to guide the assessment as to whether an area is wood-pasture.



Appendix 1

Axiophytes

Adoxa moschatellina
Agrimonia eupatoria
Aira caryophyllea
Aira praecox
Anagallis arvensis
Anagallis tenella
Anchusa arvensis
Anemone nemorosa
Arenaria serpyllifolia
Arctostaphylos uva-ursi
Avenula pubescens
Berula erecta
Betonica officinalis
Blechnum spicant
Briza media
Bromopsis erecta
Bromopsis ramosus/ramosa
Calamagrostis canescens
Calluna vulgaris
Caltha palustris
Campanula latifolia
Campanula rotundifolia
Campanula trachelium
Cardamine amara
Cardamine pratensis
Carex acuta
Carex disticha
Carex elata
Carex hostiana
Carex laevigata
Carex paniculata
Carex pilulifera
Carex pseudocyperus
Carex pulicaris
Carex remota
Carex riparia
Carex rostrata
Carex sylvatica
Carpinus betulus
Chrysanthemum segetum
Chrysosplenium oppositifolium
Colchicum autumnale
Convallaria majalis
Ceratocapanos claviculata
Cirsium dissectum
Crataegus laevigata
Crepis paludosa
Dactylorhiza incarnata
Dactylorhiza maculata
Dactylorhiza praetermissa
Danthonia decumbens
Daphne laureola
Dryopteris carthusiana
Epipactis palustris
Erica cinerea
Erica tetralix
Erophila verna
Euonymus europaeus
Euphorbia amygdaloides
Filago minima
Frangula alnus
Galium odoratum
Galium uliginosum
Galium verum
Genista anglica
Hordelymus europaeus
Hyacinthoides non-scripta
Hydrocotyle vulgaris
Hypericum elodes
Hypericum humifusum
Hypericum pulchrum
Jasione montana
Juncus subnodulosus
Lamium amplexicaule
Lamium hybridum
Lathraea squamaria
Lathyrus montanus/linifolis
Leontodon hispidus
Leontodon saxatilis
Listera ovata
Luzula pilosa
Lychnis flos-cuculi
Lysimachia nemorum
Lysimachia vulgaris
Lythrum salicaria
Melampyrum pratense
Menyanthes trifoliata
Milium effusum
Narthecium ossifragum
Ophioglossum vulgatum
Orchis mascula
Oreopteris limbosperma
Osmunda regalis
Ornithopus perpusillus
Pedicularis palustris
Pedicularis sylvatica

Persicaria amphibium
Pimpinella saxifraga
Plantago media
Poa nemoralis
Polygonatum multiflorum
Polystichum aculeatum
Polystichum setiferum
Populus tremula
Potentilla erecta
Potentilla palustris
Poterium sanguisorba
Primula veris
Prunus avium
Prunus padus
Primula vulgaris
Pulicaria dysenterica
Ranunculus arvensis
Ranunculus auricomus
Ranunculus lingua
Ranunculus sceleratus
Rhamnus catharticus cathartica
Rhinanthus minor agg.
Rubus saxatilis
Rumex hydrolapathum
Sanguisorba officinalis
Sanicula europaea

Salix pentandra
Schoenus nigricans
Scirpus sylvaticus
Scutellaria galericulata
Scutellaria minor
Senecio aquaticus
Solidago virgaurea
Stachys palustris
Stellaria neglecta
Stellaria palustris
Succisa pratensis
Symphytum officinale
Tamus communis
Taxus baccata
Thalictrum flavum
Tilia cordata
Trisetum flavescens
Triglochin palustris/palustre
Ulex gallii
Vaccinium oxycoccos
Valeriana dioica
Vaccinium vitis-idaea
Veronica officinalis
Veronica scutellata
Viola palustris
Viburnum lantana

Appendix 2

Ancient Woodland Indicators (AWI)

Amongst the UK's woodland ground flora there are several species that are indicative of Ancient Semi-Natural Woodland. The species which are attributed with helping to identify this type of woodland differ across the regions and counties, with some species considered to be indicators in some counties whilst not in others. The AWI species list for Barnsley has been taken from M. Jones' Rotherham's Woodland Heritage as this was identified as the AWI list appropriate to South Yorkshire in the report for the Woodland Trust 'Survey of the Coverage, Use and Application of Ancient Woodland Indicator Lists in the UK'⁷

<i>Ajuga reptans</i>	Common Bugle
<i>Allium ursinum</i>	Ransoms
<i>Anemone nemorosa</i>	Wood Anemone
<i>Calamagrostis canescens</i>	Purple Small-reed
<i>Campanula trachelium</i>	Bats in the Belfry
<i>Carex pallascens</i>	Pale Sedge
<i>Carex pendula</i>	Pendulous Sedge
<i>Carex remota</i>	Remote Sedge
<i>Conopodium majus</i>	Pignut
<i>Convallaria majalis</i>	Lily-of-the-Valley
<i>Crataegus laevigata</i>	Midlands Hawthorn
<i>Epipactis helleborine</i>	Broad-leaved Helleborine
<i>Equisetum sylvaticum</i>	Wood Horsetail
<i>Euonymus europaeus</i>	Spindle
<i>Fragaria vesca</i>	Wild Strawberry
<i>Gallium odoratum</i>	Woodruff
<i>Geum rivale</i>	Water Avens
<i>Helleborus viridis</i>	Green Helleborine
<i>Hordelymus europaeus</i>	Wood Barley
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hypericum hirsutum</i>	Hairy St John's-wort
<i>Hypericum humifusum</i>	Trailing St John's-wort
<i>Lamiastrum galeobdolon</i>	Yellow Archangel
<i>Lathraea squamaria</i>	Toothwort
<i>Luzula pilosa</i>	Hairy Wood-rush
<i>Luzula sylvatica</i>	Great Wood-rush
<i>Lysimachia nemorum</i>	Yellow Pimpernel
<i>Melampyrum pratense</i>	Cow-wheat
<i>Melica uniflora</i>	Wood Melick
<i>Mercurialis perennis</i>	Dog's Mercury
<i>Milium effusum</i>	Wood Millet
<i>Orchis mascula</i>	Early Purple Orchid

⁷ Survey of the Coverage, Use and Application of Ancient Woodland Indicator Lists in the UK, (2009), P. Galves, I. D. Rotherham, B. Wright, C. Handley and J. Birbeck), Hallam Environmental Consultants, Sheffield Hallam University

<i>Oxalis acetosella</i>	Wood Sorrel
<i>Potentilla sterilis</i>	Barren Strawberry
<i>Primula vulgaris</i>	Primrose
<i>Quercus petraea</i>	Sessile Oak
<i>Sanicula europaea</i>	Sanicle
<i>Sorbus torminalis</i>	Wild Service Tree
<i>Stellaria holostea</i>	Greater Stitchwort
<i>Tilia cordata</i>	Small-leaved Lime
<i>Veronica Montana</i>	Wood Speedwell
<i>Vicia sepium</i>	Bush Vetch