West Pennine Moors SSSI

Supporting Information

A supplement to the notification document

Issued by Natural England's Cheshire, Greater Manchester, Merseyside & Lancashire Team on 17 November 2016

Contact points and further information

This supplementary information to the West Pennine Moors SSSI notification document is issued on request by Natural England's Cheshire, Greater Manchester, Merseyside & Lancashire Team and is intended to be read in conjunction with the notification document for owners, occupiers and other notified parties. Our address for correspondence is:

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https://consult.defra.gov.uk/consultation_finder/

Your contact point for enquiries relating to this notification is: the West Pennine Moors SSSI Team consisting of Rosemary Budd, Karen Rogers, Ben Hibbins and Amy Cowburn.

Contents

1. Summary

The West Pennine Moors SSSI is notified under section 28C of the Wildlife and Countryside Act 1981 (as amended). The site supports an extensive mosaic of upland and upland-fringe habitats. It is of special interest for the following nationally important features that occur within and are supported by the wider habitat mosaic:

- blanket bogs;
- wet and dry heathlands;
- acid and lime-rich flushes;
- rush pastures and mire grasslands;
- acid grasslands;
- neutral hay meadows and pastures;
- wet and dry broadleaved woodlands and scrub;
- diverse assemblages of upland moorland, in-bye and woodland breeding birds;
- breeding black-headed gulls *Chroicocephalus ridibundus*, Mediterranean gulls *Larus melanocephalus* and grey herons *Ardea cinerea*; and
- populations of starry *Alchemilla acutiloba* and large-toothed lady's-mantles *A. subcrenata* and floating water-plantain *Luronium natans*.

2. Information used to support the selection of the West Pennine Moors SSSI

Feature	Data Source	Author	Date	Content
General	Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapters: 2a. Woodlands; 7. Fens; 8. Bogs; 9. Uplands; 11. Vascular plants. Nature Conservancy Council, Peterborough	Nature Conservancy Council (NCC)/JNCC	1989-1994	National selection guidelines for biological SSSIs (re-published online by JNCC in 2012)
	British Plant Communities. Volume 1: Woodlands and Scrub. Cambridge University Press	Rodwell, J.S. (ed).	1991	National Vegetation Classification (NVC) for woodlands and scrub communities
	British Plant Communities. Volume 2: Mires and Heaths. Cambridge University Press	Rodwell, J.S. (ed).	1991	National Vegetation Classification (NVC) for fen-meadow communities
	British Plant Communities: Volume 3: Grasslands and Montane Communities. Cambridge University Press	Rodwell, J.S. (ed).	1992	National Vegetation Classification (NVC) for lowland grassland communities
	British Plant Communities. Volume 4: Aquatic communities, swamps and tall-herb fens. Cambridge University Press.	Rodwell, J.S. (ed).	1995	National Vegetation Classification NVC for aquatic communities, swamps and tall-herb fens
	West Pennine Moors: A Conspectus for Statutory Designation. West Pennine Moors Biodiversity Group	Jepson, P., Melling, T. & Martin, S.J	2007	Discussion regarding the proposal to designate the WPM as an SSSI
	Addendum to West Pennine Moors: A Conspectus for Statutory Designation. West Pennine Moors Biodiversity Group.	Jepson, P., Martin, S.J	2008	Additional information supplementing the above paper
	Guidelines for selection of biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection	Joint Nature Conservation Committee (JNCC)	2013	Rationale, Operational Approach and Criteria for Site Selection
	Vegetation survey of the West Pennine Moors moorland fringe. Report to Natural England	Skelcher, G. Ecological Consultant	2013	NVC survey, including quadrat data and maps
	Vegetation Survey of West Pennine Moors pSSSI. Report to Natural England	Ross, S. (Penny Anderson Associates)	2014	NVC survey, including field notes, quadrat data, aerial photos, maps, records of rare/scarce plants and lichens

Feature	Data Source	Author	Date	Content
	Vegetation survey of twelve sites considered for addition to the West Pennine Moors pSSSI. Report to Natural England	Skelcher, G. Ecological Consultant	2014	NVC survey, including quadrat data and maps
Upland habitats	Nature Conservation Review – Volume 1. Published by NCC	Ratcliffe, D.A.	1977	Descriptors for the range and feature of the British uplands
	An Illustrated Guide to British Upland Vegetation. JNCC, Peterborough	Averis, B. *et al.*	2004	Upland vegetation
	Consultation and production of a recommended set of standards for UK BAP habitat data. Volume 1: Specification for field survey and mapping to BAP Priority Habitats and Annex 1 Habitats; Volume 2: Translation frameworks and sample case studies; Volume 3: Definitions and rule bases for BAP Priority Habitats. Report to Natural England	GeoData Institute (University of Southampton)	2011	Description of survey methods and guidance regarding NVC type choice.
	UK Biodiversity Action Plan – Priority Habitat Descriptions. Biodiversity Reporting and Information Group (BRIG)	BRIG (ed. Maddock, A.)	2008 update 2011	Descriptions of priority habitats
	Specialist support for notification of West Pennine Moors as a SSSI for uplands	Crowle, A.	2016	Support for notifying the site for upland habitats from Natural England's senior uplands specialist
Grassland	A study into the effects of change in management on grasslands in the West Pennine Moors (Post-graduate diploma in Countryside Management 1st year project). Manchester Polytechnic	Jepson, P	1984	Records of plant species used for comparison.
	English Nature Grassland Inventory; Quadrat data for Sunnyhurst Meadows, Darwen	English Nature	1986	Records of plant species used for comparison.
	Neutral grassland sites in Lancashire to 1993. English Nature internal report	Stewart, A (English Nature)	1994	Records of plant species used for comparison.
	Upland survey Higher Wenshead Farm. Lancashire Rural Futures report	MacDonal, D.	2003	Records of plant species used for comparison

Feature	Data Source	Author	Date	Content
	Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 3. Lowland grasslands. JNCC, Peterborough	Jefferson, R.G., Smith, S.L.N. & MacKintosh, E.J.	2014	National selection guidelines for SSSIs for lowland grasslands
	Specialist support for notification of West Pennine Moors as a SSSI for grassland	Jefferson, R.G.	2016	Support for notifying the site for grassland features from Natural England's senior grassland specialist
Woodland	Woodland surveys in north west England using the National Vegetation Classification [and] Supplement: distribution maps of woodland NVC types north-west England 1992. English Nature internal report	Stewart, A., Donnison, E. & Dalton, A.	1993	Information on woodlands within the wider Area of Search.
	Longworth Clough – National Vegetation Classification 1999. Report to Lancashire Wildlife Trust	Pennine Ecological	1999	NVC survey of Longworth Clough
	Specialist support for notification of West Pennine Moors as a SSSI for woodland	Goldberg, E.	2016	Support for notifying the site for woodland features from Natural England's senior woodland specialist
Flowering plants	Vascular plant survey. Report to Natural England	Jepson, P.	2012	Confirms presence of rare species
	Alchemilla subcrenata in Lancashire. Email correspondence	Walker, K. (Botanical Society of Britain & Ireland)	2014	Confirms status of *Alchemilla* species
	Specialist support for notification of West Pennine Moors as a SSSI for vascular plants	Martin, J.P.	2016	Support for notifying the site for vascular plant features from Natural England's senior vascular plant specialist
Birds	Belmont Reservoir Gull Survey 2011. Report to United Utilities	Martin, S.J.	2011	Records of breeding gulls on Belmont reservoir
	Belmont Reservoir Gull Survey 2012	Martin, S.J.	2012	Records of Breeding gulls on Belmont reservoir
	Belmont Reservoir Gull Survey 2013. Report to United Utilities.	Martin, S.J.	2013	Records of Breeding gulls on Belmont reservoir
	Belmont Reservoir Gull Survey 2014. Report to United Utilities.	Martin, S.J.	2014	Records of Breeding gulls on Belmont reservoir

Feature	Data Source	Author	Date	Content
	The state of Lancashire's birds: an atlas survey of the breeding and wintering birds of Lancashire and North Merseyside, 2007-2011. Lancashire and Cheshire Fauna Society, Riston	White, S. *et al.,*	2013	Tetrad record data for breeding birds, available online http://www.lacfs.org.uk/Lancs%20Birds.html
	BTO national data set	BTO	2013	Data regarding the Lower House Plantation Heronry
	Population Estimates of birds in Great Britain and the United Kingdom. *British Birds* **106**: 57-102	Musgrove *et al.*	2013	National population levels
	Supplementary bird information – woodlands and Rivington in-bye area. Report to United Utilities	Johnson, C., Johnson, T. & Martin, S.	2014	Records for breeding birds
	Supplementary bird information – estimated populations of selected breeding birds. Report to Natural England	Martin, S.J – BTO Regional Survey Organiser	2014	Records for breeding birds
	Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 14. Birds. JNCC, Peterborough	Drewitt, A.L., Whitehead, S. & Cohen, S.	2015	National selection guidelines for SSSIs for birds
	Specialist support for notification of West Pennine Moors as a SSSI for Birds	Drewitt, A.	2016	Support for notifying the site for birds from Natural England's senior ornithologist

3. Explanation of how the West Pennine Moors meets the SSSI selection guidelines

This section explains how the information listed in section 2 has informed the decision to notify the SSSI, according to the *Guidelines for the selection of Biological SSSIs. Part 1: Rationale, Operational Approach and Criteria for Site Selection* (JNCC, 2013) and *Part 2: Detailed guidelines for habitats and species groups*, hereafter referred to as 'the Guidelines'.

The blanket bog, upland heathland and upland flush habitats have been assessed using Chapter 9: Uplands and blanket bog has been assessed additionally using Chapter 8: Bogs. The remaining habitats and features have been assessed using the following guidelines:

- woodland habitats – Chapter 2a: Woodlands;
- moorland fringe habitats including mire grasslands, rush pastures, acid and neutral grasslands – Chapter 3: Lowland Grasslands;
- the lady's-mantles and floating water-plantain – Chapter 11: Vascular Plants; and
- breeding bird assemblages and populations – Chapter 17: Birds.

3.1 Upland habitats

The West Pennine Moors form an upland site comprising three distinct moorland blocks; from Withnell, Anglezarke and Rivington Moors in the west, through Darwen and Turton Moors in the

central area, to Oswaldtwistle, Haslingden and Holcombe Moors in the east of the site. The upland massif consists of blanket bog plateaus transitioning into sloping hillsides with a mosaic of heathland, streams, flushes, wooded cloughs and unimproved grassland (see priority habitat maps in section 8 and photographs 5 and 13 in section 9). The site is bordered by urban developments in the valley bottoms and major road infrastructure.

The geology of the area is Carboniferous comprising Millstone Grit and Lower Coal Measures with much of the solid geology covered by boulder clay. Peat covers most of the unenclosed moorlands, in places to depths exceeding 2 metres within extensive hydrological systems. The juxtaposition of permeable and impermeable geology gives rise to numerous springs and flushes around the moorland flanks - these like much of the area are acid in nature. However locally, where groundwater seeps from shale bands containing marine deposits, base-rich flushes occur.

The varied geology gives rise to a wide variety of habitat types and the unenclosed upland areas support the following National Vegetation Community (NVC) types:

Blanket bogs (3,812 ha) (see photographs 1 and 2 in section 9)

M2 *Sphagnum cuspidatum/recurvum* bog pool community
M3 common cottongrass *Eriophorum angustifolium* bog pool community
M18 cross-leaved heath *Erica tetralix* – papillose bog-moss *Sphagnum papillosum* raised and blanket mire
M19 heather *Calluna vulgaris* – hare's-tail cottongrass *Eriophorum vaginatum* blanket mire
M20 hare's-tail cottongrass *Eriophorum vaginatum* blanket mire
M21 bog asphodel *Narthecium ossifragum* – papillose bog-moss *Sphagnum papillosum* valley mire
M25 purple moor-grass *Molinia caerulea* – tormentil *Potentilla erecta* mire

Dwarf shrub heath (306 ha) (see photographs 2 and 3 in section 9)

H8 heather *Calluna vulgaris* – western gorse *Ulex gallii* heath
H9 heather *Calluna vulgaris* – wavy hair-grass *Deschampsia flexuosa* heath
H12 heather *Calluna vulgaris* – bilberry *Vaccinium myrtillus* heath
M15 deergrass *Scirpus cespitosus* – cross-leaved heath *Erica tetralix* wet heath

Flushes, rush pastures and mire grasslands (195 ha, a total of 115 ha of upland fen, marsh and swamp plus a series of transitional mosaic habitats of 80 ha) (see photographs 4 and 10 in section 9)

S3 greater tussock sedge *Carex paniculata* swamp
M6 star sedge *Carex echinata* – *Sphagnum recurvum/auriculatum* mire
M9 bottle sedge *Carex rostrata* – pointed spear-moss/giant spear-moss *Calliergon cuspidatum/giganteum* mire
M10 dioecious sedge *Carex dioica* – common butterwort *Pinguicula vulgaris* mire
M23 soft-rush/sharp-flowered rush *Juncus effusus/acutiflorus* – marsh-bedstraw *Galium palustre* rush pasture (some overlap exists between the upland habitats and moorland fringe grasslands in this community)
M26 purple moor-grass *Molinia caerulea* – marsh hawk's-beard *Crepis paludosa* mire (some overlap exists between the upland habitats and moorland fringe grasslands in this community)
M37 curled hook-moss *Cratoneuron commutatum* – red fescue *Festuca rubra* spring

The Guidelines (Chapter 9, sections 2.1-2.8) state that:

> 'The hyperoceanic climate at the most insular, western Atlantic edge of the European continent, combined with historically widespread human impact has produced a distinctive landscape and range of ecosystems, which are not duplicated anywhere in the world. There is an unusually wide range of podsolic soils, grading into blanket bog peat, which in Britain has one of the most extensive world occurrences. The following biological features are particularly important...acidophilus dwarf shrub heath and scrub...acidic and calcicolous grassland...blanket bog...ornithological features…'

The upland habitats of the West Pennine Moors form a diverse mosaic which includes examples of:

- blanket bog – NVC types M2, M3, M18, M19, M20, M21 and M25, as described in the sub-section below; and
- acidophilus dwarf shrub heath and scrub – NVC types H8, H9, H12 and M15;
- acidic and neutral grassland – NVC types U4, U5, MG3, MG5 and MG8, as well as mire grasslands and rush pastures M23, M25 and M26 (see section on moorland fringe grasslands below);
- ornithological features – a mixed upland moorland (without water bodies) and in-bye & allotment farmland breeding bird assemblage, as described in the sub-section below.

The Guidelines (Chapter 9, section 3.3) emphasise the importance of geographical gradients and ecological variability and state that:

> 'The primary choice is thus to select areas representing those main geological formations which appear to account for significant ecological variability between upland massifs within the AOS [Area of Search].'

The Guidelines (Chapter 9, section 3.4) further state that:

> 'In assessing these geologically-determined ecological differences between uplands, there are three major kinds of variation to consider:
>
> > 3.4.1 Differences in physiographic and especially glacial history, which can produce large topographic differences;

Both the South Pennine Moors SSSI and West Pennine Moors SSSI lie within the Southern Pennines National Character Area (NCA)[1]. Although sharing similar geology, when compared to the South Pennine Moors SSSI, the West Pennine Moors represents a more western oceanic counterpart. In general the altitudes are 100 metres lower in the West Pennine Moors with individual moorlands falling as low as 250 metres. This oceanic character is demonstrated by the presence of M18 raised mire and blanket mire, a community described by Rodwell (1991) as 'typical at low altitudes in moderately oceanic parts of Britain'. Being slightly lower in elevation and further west leads to slight differences in the climate and, therefore, associated species and habitats.

The Guidelines (Chapter 9, section 3.6) state:

> '…It is thus necessary to build up a suite of sites for each AOS according to the amount of ecological variety present and how it chances to be distributed.'

The West Pennine Moors SSSI provide an example of upland habitats that occur at lower altitudes and provide an important contrast with the other notified upland sites within the Southern Pennines NCA so that, taken together, the two notified sites represent a continuum from the lower-lying West Pennine Moors to the higher South Pennine Moors.

The Guidelines (Chapter 9, section 4.3) state:

> '...The aim should be to select a topographic unit as complete as possible in regard to these physical features, so that it can run form the highest to the lowest feasible elevation, in relation to all directional aspects. Ideally this means representing all the different catchments which drain for the main watershed down to the point at which open hill ground changes to enclosed farmland and plantation woodland.'

The Guidelines (Chapter 9, section 4.7) further state:

[1] National Character Areas (NCAs) divide England into 159 natural areas, each defined by a unique combination of landscape, biodiversity, geodiversity and economic and cultural activity. West Pennine Moors SSSI lies within the Southern Pennines NCA. NCAs are now used as 'areas of search' for the purposes of SSSI selection (where appropriate) in England. For more information on NCAs, see https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making

> ‘The selection objective is to represent within each upland site the range of recorded features in their particular dynamic and spatial relationships.’

The Guidelines (Chapter 9, section 4.8) additionally state:

> ‘...there are some areas, especially with ornithological interest where it will be desirable to include within the site some of the enclosed marginal land lying below the upland boundary and consisting of grassland, mire or even woodland.’

The West Pennine Moors SSSI is a distinctly defined area that includes as much of the physical features and functionality of the upland massif as possible. The site encompasses the upland moorland areas and extends downslope to also include some of the moorland fringe habitats on the lower slopes. The inclusion of the moorland fringe habitats, particularly the acid and neutral grasslands, ensures that species such as twite, golden plover and curlew in the upland moorland and in-bye breeding bird assemblage not only have protected nesting sites but also sufficient feeding grounds necessary to support the population as a whole. The moorland fringe provides key habitat for the breeding gull populations at Belmont Reservoir and for waders of the upland moorland and in-bye bird assemblage such as curlew, snipe and redshank which use the rush pastures and mire grasslands at the foot of the upland area adjacent to the water body.

The Guidelines (Chapter 9, section 4.9) state:

> ‘…the desirable minimum size for an upland site, based on selection of a topographical unit, will be of the order of 4,000 ha, though some isolated, compact or especially steep massifs or those with special but localised geological features may be smaller.’

The West Pennine Moors SSSI covers 7,662.40 ha and therefore significantly exceeds the recommended minimum area.

The Guidelines (Chapter 9, section 5.1) state:

> ‘…For rare and specialised features, and particularly for those habitats which occur only within one or a few AOSs, single examples will not be enough and larger representation should be sought. For the following rare habitats, there should be the presumption in favour of selecting all good examples, quality being determined by extent, floristic conformity to NVC types, lack of disturbance and presence of any features special to the particular habitat.
>
> > 5.1.1 Calcareous habitats forming notable plant refugia (cliffs, screes, grasslands, marshes and flushes)’

The West Pennine Moors has a number of calcareous flush and spring complexes supporting the following NVC communities: M9 mire, M10 mire and M37 spring. These communities are an exceptional feature for Gritstone/Coal Measure uplands.

Poor-fen communities have hydrological links with peat bodies and the Guidelines (Chapter 7, section 8.4) state that:

> ‘...poor fen communities associated with blanket mires add habitat diversity to this vegetation type and form intimate hydrological links with the main peat body: They should therefore be included within the site boundary.’

Throughout the West Pennine Moors, soligenous fens of NVC type M6 mire occur in combination with the M23 rush pasture community and have therefore been included within the SSSI boundary. These soligenous mires occur as flushed habitats in places where water seeps out of the peat or underlying strata. Due to the underlying geology these features are generally base-poor. Typically these flushes arise from rushy seepage lines of M23 rush pasture and comprise a range of sub-communities within the M6 mire. The M6 mire community is a particular feature of the area, being widespread and frequent, and associated with the more extensive blanket mire communities.

3.1.1 Blanket bog

The West Pennine Moors SSSI is considered to be of special interest for its extensive cover of blanket bog.

The Guidelines indicate that if bogs meet the minimum standards for selection the habitat qualifies for SSSI status. The Guidelines (Chapter 8, section 3.5) state:

> 'The general quality of a bog is assessed by the degree to which it has remained intact as a hydrological and vegetational system capable of active peat growth. Peat formation capability for both raised and blanket bogs is defined by the hydrological and biotic features described in Annex 1, the definition of `active' raised and blanket bogs adopted by the European Union.'
>
> 'Raised bogs larger than 10 ha and blanket bogs larger than 25 ha should be considered for SSSI status in all parts of Britain if capable of forming peat.'

Annex 1 referred to above comprises the list of Priority Habitat Types of the European Union Habitats Directive 92/43/EEC. This describes blanket bogs as:

> 'Extensive bog communities or landscapes on flat or sloping ground with poor surface drainage, in oceanic climates with heavy rainfall, characteristic of western and northern Britain and Ireland. In spite of some lateral water flow, blanket bogs are mostly ombrotrophic. They often cover extensive areas with local topographic features supporting distinct communities [*Erico-Sphagnetalia magellanici: Pleurozio purpureae-Ericetum tetracilis, Vaccinio-Ericetum tetracilis p.; Scheuchzerietalia palustris p., Utricularietalia intermedio-minoris p., Caricetalia fuscae p.]. Sphagna* play an important role in all of them but the cyperaceous component is greater than in raised bogs.
>
> 'Active' is defined as supporting a significant area of vegetation that is normally peat-forming. Typical species include the important peat-forming species, such as bog-mosses *Sphagnum* spp. and cottongrasses *Eriophorum* spp., or purple moor-grass *Molinia caerulea* in certain circumstances, together with heather *Calluna vulgaris* and other ericaceous species. Thus sites, particularly those at higher altitude, characterised by extensive erosion features, may still be classed as 'active' if they otherwise support extensive areas of typical bog vegetation, and especially if the erosion gullies show signs of recolonisation.'

Natural England estimates that the West Pennine Moors SSSI includes 3,812 ha of blanket bog. The West Pennine Moors contains a number of peatland mesotopes (a single mire unit or hydrological entity) including watershed and saddle mires, largely around Darwen and Turton Moors, valley mires around Anglezarke, Darwen and Turton Moors, a basin mire on the summit of Longworth Moor and a Schwingmoor close to Spate Brook. Within these mesotopes, an M21 valley mire community occurs in one location along the base of the steep moorland slope. Across the moorland plateaux a series of bog pool communities occur (NVC types M2 and M3 bog pool communities) forming microtopic features (natural surface patterns within the blanket bog).

Not all blanket bog has been assessed as being capable of peat forming, and therefore classified as active blanket bog. Areas of active blanket bog are located within the following NVC communities:

- M18 raised and blanket mire;
- M19 blanket mire;
- M20 blanket and raised mire;
- Areas of M25 purple moor-grass mire where cottongrasses and bog-mosses *Sphagnum* speces are present
- a mosaic of the above M19/20 communities; and
- discrete areas of M2 bog pool community, M3 bog pool community and M21 valley mire.

As part of the vegetation survey, peat depth was measured and the areas associated with the above NVC communities have a minimum depth of existing peat of greater than 40cm, as per Natural England guidance. The blanket bog communities listed above are dominated by plants that are associated with peat forming vegetation. The M18 mire consists of cross-leaved heath, cranberry *Vaccinium oxycoccos*, papillose bog-moss *Sphagnum papillosum* and lustrous bog-moss *S. subnitens*. In places this association of plants occurs in patches within stands of abundant heather, as well as in swards dominated by purple moor-grass or mixed swards of purple moor-grass with hare's-tail cottongrass. The M19 and M20 communities also contain peat-forming

vegetation including heather, common cottongrass, hare's-tail cottongrass and crowberry *Empetrum nigrum* with varying quantities of purple moor-grass.

Of the wider 3,812 ha of blanket bog communities, bog-mosses or cottongrasses are present across 3,483 ha which have been assessed as being capable of forming peat and, hence, are classified as active blanket bog. This includes 2,795 ha where bog-mosses or cottongrasses are not only present but are frequent within the sward, of which 1,015 ha has frequent bog-mosses.

Fourteen species of bog-mosses have been recorded within the site: red bog-moss *Sphagnum capillifolium*, compact bog-moss *S. compactum*, feathery bog-moss *S. cuspidatum*, cow-horn bog-moss *S. denticulatum*, flat-topped bog-moss *S. fallax*, fringed bog-moss *S. fimbriatum*, lesser cow-horn bog-moss *S. inundatum*, magellanic bog-moss *S. magellanicum*, blunt-leaved bog-moss *S. palustre*, papillose bog-moss *S. papillosum*, Russow's bog-moss *S. russowii*, spiky bog-moss *S. squarrosum*, lustrous bog-moss *S. subnitens* and soft bog-moss *S. tenellum*. This is uncommon of many upland areas in the South Pennines, where bog mosses have almost disappeared as a result of historic atmospheric sulphur pollution. Great sundew *Drosera anglica* has also been recorded on the blanket peats, most recently in 2016, both in the Belmont area and in the eastern moors. The following other peat-forming species listed in Annex 1 (referred to above) are frequently present in the West Pennine Moors: heather, cross-leaved heath, common cottongrass, hare's-tail cottongrass and purple moor-grass.

There are also degraded areas of blanket bog which, due to historic or current management or repeated arson, do not currently support the necessary vegetation type for peat formation but do have a minimum depth of peat at 40cm and have the capability of being restored to peat forming areas of blanket bog. These areas are predominantly referable to the NVC community M25 mire.

The blanket bogs of the West Pennine Moors are less drained, relative to the South Pennine Moors SSSI, the other large expanse of blanket bog habitat within the Area of Search (AoS). Darwen, Turton and Anglezarke Moors in the west are subject to the highest incidence of drainage, whilst the eastern moors around Hoddlesden and Ramsbottom are relatively free of drainage, as is Winter Hill in the south west of the site. Much of the historic drainage on the site has already been reversed through ditch-blocking and restoration works. The site has not been cut for peat other than in very rare local instances. In addition, relative to the South Pennines SSSI, only small areas of the blanket bog in the West Pennine Moors are managed by rotational burning. Hence, little habitat has been damaged over time by prolonged drying, guttering and peat pipes. Damage to the blanket peats of the West Pennine Moors has predominantly been due to the combined effects of over-grazing, historic atmospheric pollution and periodic uncontrolled burning from wildfires. Hence, hydrologically the West Pennine Moors are relatively intact.

3.1.2 Upland breeding birds

The West Pennine Moors supports a mixed breeding bird assemblage for upland moorland without water bodies and upland in-bye and allotment farmland habitats.

The Guidelines (Chapter 17, section 3.8) state that:

> 'Localities which support an especially good range of bird species characteristic of a particular habitat, as defined by an index value, will qualify for SSSI selection.'

Annex 1 of the Guidelines state that:

> 'if two habitats are included in one well-defined site, the indices for species which are on both habitats list and have been recorded for the site should be double-counted; other species score in the usual way; for the site to qualify on this basis its total score should exceed the qualifying threshold value for the two habitats combined.'

Annex 1 of the Guidelines shows that for upland moorland without water bodies the threshold site-index value is 27 and that for upland in-bye and allotment farmland the threshold site-index value is 13.5. This makes a combined threshold of 40.5.

As shown in Table 1 (below), the West Pennine Moors SSSI has an assemblage of upland birds breeding within the site that exceeds the figure quoted in the Guidelines with a mixed habitat site-

index value of 58. Only species with probable or confirmed breeding status[2] within the site have been included. The assemblage includes merlin *Falco columbarius*, snipe *Gallinago gallinago*, redshank *Tringa totanus*, curlew *Numenius arquata*, golden plover *Pluvialis apricaria* and twite *Linaria flavirostris*, many of which are declining in Britain.

The following species have not been scored as breeding within the West Pennine Moors because breeding evidence is occasional, unconfirmed or has only recently been established.

- Hen harriers *Circus cyaneus* made breeding attempts in 2001 and 2005. Birds were present in the breeding seasons of 2006, 2007, 2008 and 2012 but were thought not to breed.
- Ring ouzel *Turdus torquatus* was last confirmed breeding in 2000, although pairs may have bred in 2002/2003. Birds were recorded in the area in 2007 and 2011 but no probable or confirmed breeding sites were located.
- Whinchat *Saxicola rubetra* was once not uncommon and bred at known sites up to 2006/2008. They are now irregular visitors and sporadic breeders with only two pairs confirmed breeding in 2014. This single year's breeding was not deemed sufficient evidence to include the species within the assemblage score.

If any of these species (or other potential assemblage species listed in the Guidelines) breeds in the SSSI in future, they will be protected as part of the notified breeding bird assemblage.

[2] Evidence of probable or confirmed breeding is defined by the British Trust for Ornithology as follows and must relate to birds recorded in potentially suitable nesting habitat:

Probable breeding:

- Pair observed in suitable nesting habitat in breeding season
- Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two different days a week or more part at the same place or many individuals on one day
- Courtship and display (judged to be in or near potential breeding habitat; be cautious with wildfowl)
- Visiting probable nest site
- Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby
- Brood patch on adult examined in the hand, suggesting incubation
- Nest building or excavating nest-hole

Confirmed breeding:

- Distraction-display or injury feigning
- Used nest or eggshells found (occupied or laid within period of survey)
- Recently fledged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat.
- Adults entering or leaving nest-site in circumstances indicating occupied nest (including high nests or nest holes, the contents of which cannot be seen) or adults seen incubating
- Adult carrying faecal sac or food for young
- Nest containing eggs
- Nest with young seen or heard

Table 1 Breeding birds of upland moorland without waterbodies and upland in-bye and allotment farmland in the West Pennine Moors SSSI

Species	Upland moorland without water bodies	Index species score	Upland in-bye and allotment farmland	Index species score	Combined species scores
Teal *Anas crecca*	✓	3			3
Red grouse *Lagopus lagopus*	✓	1			1
Grey Partridge *Perdix perdix*			✓	2	2
Buzzard *Buteo buteo*	✓	2			2
Merlin *Falco columbarius*	✓	3.5			3.5
Peregrine *Falco peregrinus*	✓	3			3
Golden plover *Pluvialis apricaria*	✓	2			2
Lapwing *Vanellus vanellus*			✓	1	1
Dunlin *Calidris alpina*	✓	2.5			2.5
Snipe *Gallinago gallinago*	✓	2	✓	2	4
Curlew *Numenius arquata*	✓	2	✓	2	4
Redshank *Tringa tetanus*	✓	2	✓	2	4
Cuckoo *Cuculus canorus*	✓	2.5	✓	2.5	5
Short-eared owl *Asio flammeus*	✓	3.5			3.5
Raven *Corvus corax*	✓	3			3
Dipper *Cinclus cinclus*	✓	2.5			2.5
Stonechat *Saxicola rubicola*	✓	2			2
Wheatear *Oenanthe oenanthe*	✓	1			1
Grey wagtail *Motacilla cinerea*	✓	2			2
Linnet *Linaria cannabina*			✓	1	1
Twite *Linaria flavirostris*	✓	2.5	✓	2.5	5
Reed Bunting *Emberiza schoeniclus*			✓	1	1
Total score		42		16	**58**

Sources: White *et al.* (2013) and S Martin – BTO Regional Survey Organiser (2014)

3.2 Woodland

The SSSI includes at least 33 ha of ancient woodland and scrub communities (see photographs 6 and 7 in section 9) including the following NVC types:

- W2 grey willow *Salix cinerea* – downy birch *Betula pubescens* – common reed *Phragmites australis* woodland
- W4 downy birch *Betula pubescens* – purple moor-grass *Molinia caerulea* woodland
- W5 alder *Alnus glutinosa* – greater tussock-sedge *Carex paniculata* woodland
- W7 alder *Alnus glutinosa* – ash *Fraxinus excelsior* – yellow pimpernel *Lysimachia nemorum* woodland
- W11 sessile oak *Quercus petraea* – downy birch *Betula pubescens* – wood-sorrel *Oxalis acetosella* woodland
- W16 oak *Quercus* spp. – birch *Betula* spp. – wavy hair-grass *Deschampsia flexuosa* woodland
- W23 gorse *Ulex europeaus* – bramble *Rubus fruticosus* scrub
- W24 bramble *Rubus fruticosus* – Yorkshire-fog *Holcus lanatus* scrub
- W25 bracken *Pterdium aquilinum* – bramble *Rubus fruticosus* scrub

The Guidelines (Chapter 2a, section 3.3.1) state that:

> 'Ancient and long-established semi-natural woodland is the main 'pool' from which woodland SSSIs are drawn…..County ancient woodland inventories provide a useful starting point for judging present and future SSSI selection.'

In addition, the Guidelines (Chapter 2a, section 3.4.1) continue that:

> '…A basic presumption is that [Natural England] should seek to protect the largest areas available of all the major types in an AOS...'

The Guidelines (Chapter 2a, section 4.4) state that the selection procedure within each Area of Search should:

> 'Identify the best, usually the largest, candidate stands, but taking account also of relative naturalness and diversity...'

And go on to specify a minimum area threshold for selection (Chapter 2a, paragraph 4.5):

> 'Woods selected for the presence of more than one type should normally be over 5 ha and preferably over 20 ha and should be mainly semi-natural.'

The woodland areas detailed in Table 2 (below) are included as examples of ancient woodland within the Area of Search. All areas of woodland below are listed on the Ancient Woodland Inventory and are also recognised within Lancashire as examples of valuable habitat, having received notification as Sites of Biological Importance (SBI).

The ancient woodland element of three of these blocks of woodland is over 5 ha in size (see table 2). In the other three blocks, the ancient woodland element is about 4ha. However, all woodland blocks are larger than their ancient woodland element. The SBI area has been included here to provide a guide to the size of the wider woodland interest at each site, as in most cases the woodlands are discrete blocks on the moorland fringe and the SBI falls wholly or mostly within the SSSI boundary.

It should be noted that this is not the case within the larger Longworth Clough complex. The SBI and West Pennine Moors SSSI boundaries are not co-terminus; in this area the SSSI boundary mirrors the boundary of the previously notified Longworth Clough SSSI where the woodland of highest scientific interest is located.

Table 2 Ancient semi-natural woodlands in the West Pennine Moors SSSI

Woodland name	SBI name(s)	Area of SBI**	Area of ancient woodland **
Longworth Clough	Upper Longworth Clough (partial overlap)	27.2 ha	5.17 ha
Hall Wood	Upper Longworth Clough	27.2 ha	8.20 ha
Tiger's Clough	Shaw's Clough and Shaw's Wood	8.78 ha	4.09 ha
	Knoll Wood (South)	2.98 ha	
Dean Wood	Dean Wood	7.23 ha	6.75 ha
Lead Mine's Clough	Lead Mine's Clough and Twitch-Hill Clough	17.84 ha	4.11 ha
Stronsey Bank	Stronsey Bank	18.56 ha	4.66 ha
	Joan Meadow and Gorseyfield Woods	3.13 ha	

* Area taken from SBI GIS layer (2010 data)

** Area taken from Ancient Woodland Inventory extent (2012 data)

The West Pennines Moors area includes a number of clough woods which are typical of this habitat, being found along steep-sided cloughs and along some water courses. The woodlands, as ancient woodland and SBI quality, are essentially undisturbed and there is no evidence of significant intervention which would detract from their interest. All the woodland communities found within the SSSI boundary are typical for woodland on the Millstone Grit and Carboniferous Coal Measures geology of the Area of Search and accurately reflect the range of edaphic conditions, notably the complex drainage patterns.

Compared with other similar woods in the wider South Pennines Area of Search neither beech *Fagus sylvatica* nor sycamore *Acer pseudoplatanus*, both considered non-native species in woodlands of the north-west, are significant components in the canopy; they are both rare to occasional depending on the woodland. The non-native herbs pink purslane *Montia sibirica* and Himalayan balsam *Impatiens glandulifera* are frequent on wet ground within a number of the woods but this is a feature common of much of the clough Ancient Semi-natural Woodland (ASNW) in the Area of Search. In addition, the non-native shrub *Rhododendron ponticum* is present in small amounts at Tiger's Clough. The presence of these species does not significantly affect the native species complement of the site.

In terms of diversity, the woodland within Longworth Clough is composed of at least five woodland NVC communities that are classed as ASNW. The area also has three scrub NVC communities. This is in the upper range for ASNW within the Area of Search (Stewart *et al.,* 1993). Longworth Clough also has the largest stand (2.83 ha) of W5 wet woodland in the Area of Search. This NVC community is fairly local in England, confined to waterlogged organic soils which are moderately eutrophic, and is rare in the Area of Search; it is found at two sites of which Longworth Clough is one.

The majority of the remaining woodlands predominantly comprise W16 woodland but this naturally species-poor community is characteristic of the moorland fringe in the Pennine woodlands (Rodwell, 2001) and forms a key element of the upland habitat mosaic. It should, however, be noted that, in addition to their W16 stands, Lead Mine's Clough and Hall Wood have a distinctive element of W11 woodland. Hall Wood and Longworth Clough have areas of W7 woodland, while Stronsey Bank has an area of W4 wet woodland where streams issue from the hillside.

The importance of selecting smaller areas of woodland within a wider habitat mosaic is also recognised within the Guidelines (Chapter 2a, section 3.4.1)

> 'Other, sometimes smaller examples may be needed to complement the features found in the largest areas. In addition some types are naturally limited to small areas, for example alder stands along narrow seepage lines.'

They continue (Chapter 2a, section 3.4.5):

> 'Woods which adjoin or are in a mosaic with other habitats tend to be more valuable than those sharply abutted by arable or improved grassland. Diffuse, bushy or open edges are better than sharp boundaries. Within the wood clearings (natural glades and managed rides), variable topographic features (such as steep ground, rock outcrops and wet habitats), variations in drainage and abundance of dead wood increase the importance of a site through greater diversity.'

Additionally, the guidelines (Chapter 2a, section 5.2.6) state that

> 'Woodland boundaries in the uplands tend to be less well-defined both historically and ecologically than in the lowlands. Often the edges of a wood are rather diffuse because heavy grazing has prevented regeneration; as trees die the canopy thins out. In these circumstances boundaries should if possible be set somewhat beyond the area currently under trees (sometimes where a former wood boundary is apparent), to provide the open ground necessary for regeneration.'

Owshaw Clough is a diverse mosaic of rocky upland stream, mire grassland, rush pasture, heathy grassland and wet woodland. The wet woodland and other woodland component covers a small area of the wider site but is a key element of the upland mosaic in this steep-sided clough. The wet woodland is contiguous with the species-rich flushes and this provides for a diverse herb-layer containing marsh hawk's-beard *Crepis paludosa*, greater bird's-foot-trefoil *Lotus pedunculatus*, meadow vetchling *Lathyrus pratensis*, and less frequently marsh valerian *Valeriana dioica* and blue-green sedges. This juxtaposition of flush under woodland is a unique feature within the West Pennine Moors SSSI and, therefore, is reason to include the small woodland habitat component of Owshaw Clough.

3.2.1 Woodland breeding birds

The site supports a nationally important assemblage of breeding birds associated with woodland.

The guidelines (Chapter 17, section 3.8) state that:

> 'Localities which support an especially good range of bird species characteristic of a particular habitat, as defined by an index value, will qualify for SSSI selection.'

Annex 1 of the Guidelines shows that for woodlands the threshold site-index value is 39.

As shown in Table 3 (below), the West Pennine Moors SSSI exceeds the figure quoted in the Guidelines with a site-index value of 41.5. This includes probable and confirmed breeding species only. Particularly notable species are grey heron *Ardea cinerea,* tree pipit *Anthis trivialis*, redstart *Phoenicurus phoenicurus*, wood warbler *Phylloscopus sibilatrix*, spotted flycatcher *Muscicapa striata*, pied flycatcher *Ficedula hypoleuca* and willow tit *Poecile montana*.

Table 3 Woodland breeding birds within the West Pennine Moors SSSI

Species	Index species score
Grey Heron *Ardea cinerea*	2
Cuckoo *Cuculus canorus*	2.5
Sparrowhawk *Accipiter nisus*	2
Buzzard *Buteo buteo*	2
Green woodpecker *Picus viridis*	2
Great spotted woodpecker *Dendrocopos major*	1
Tree pipit *Anthus trivialis*	1.5
Stock dove *Columba oenas*	1
Woodcock *Scolopax rusticola*	2
Tawny owl *Strix aluco*	2
Redstart *Phoenicurus phoenicurus*	1.5
Garden warbler *Sylvia borin*	1
Wood warbler *Phylloscopus sibilatrix*	3
Nuthatch *Sitta europaea*	1
Jay *Garrulus glandarius*	1
Spotted flycatcher *Muscicapa striata*	2
Pied flycatcher *Ficedula hypoleuca*	2
Treecreeper *Certhia familiaris*	1
Long tailed tit *Aegithalos caudatus*	1
Coal tit *Periparus ater*	1
Willow tit *Poecile montana*	3
Raven *Corvus corax*	3
Bullfinch *Pyrrhula pyrrhula*	1
Redpoll *Acanthis cabaret*	1
Siskin *Spinus spinus*	1
Site index value	**41.5**

Sources: White *et al., (*2013); Johnson *et al.,* (2014)

3.3 Moorland fringe grasslands

The Guidelines (Chapter 3, section 4.6) state:

> '…those areas or sites supporting the NVC lowland grassland communities of high conservation value listed in section A of Annex 1…will normally qualify for SSSI selection on lowland grassland habitat grounds.'

The Guidelines continue (Chapter 3, sections 4.10 and 4.11) that:

> 'The national extent of any grassland type should be taken into account during the selection of sites for notification from those that qualify for selection. For those grassland communities that are now rare (less than 10,000 ha in Great Britain or less than 10,000 ha

in the British lowlands, as shown in section A of Annex 1) the presumption is that all examples which are at least 0.5 ha should be selected for notification, singly or in combination.'

'For those grassland types where the total British resource exceeds 10,000ha (as shown in section A of Annex 1), an exemplar approach to the selection of sites should be taken. The selection should include the best examples within an AoS, ensuring representation of the range of sub-communities and other significant variation. There should be a general presumption to select sites of 5 ha or more.'

Table 4 (below) shows the NVC vegetation types that occur within the moorland fringe, under 300m in altitude, within the West Pennine Moors which have been included within the SSSI. They exist in small pockets at the foot of the wider upland mosaic and are both an important habitat in their own right and an essential food source for seed-eating species of upland or woodland bird such as twite.

Table 4 Neutral and acid moorland fringe grasslands within the West Pennine Moors SSSI

Grassland type	Listed in Annex 1 section A of the guidelines	Estimated coverage in Great Britain	Smallest field size/ total area
MG3	Yes	less than 10,000ha	2.0ha / 7.5ha
MG5 (plus mosaics)	Yes	less than 10,000ha	1.2ha / 4.4ha
MG8	Yes	less than 10,000ha	4.6ha / 4.6ha
U4 (plus mosaic)	Yes		3.7ha / 33.3ha
U5 (plus mosaic)	Yes	less than 10,000 ha in the lowlands	2.0ha / 21.9ha
M23	Yes		0.4ha / 54.4ha
M25	Yes		2.9ha / 29.1ha
M26	Yes	less than 10,000ha	0.1ha / 5.9ha
M23/M25/M26 mosaics			0.9ha / 22.9ha

Acid grassland (U4 and U5) – 55 ha of acid grassland is found in the West Pennine Moors within enclosed fields on the upland fringe but below the moorland line of 300m (see photograph 9 in section 9). U4 sheep's-fescue *Festuca ovina* – common bent *Agrostis capillaris* – heath bedstraw *Gallium saxatile* grassland and U5 mat-grass *Nardus stricta* – heath bedstraw *Gallium saxatile* communities are represented. These acid grasslands occur mainly in mosaic with other moorland fringe grassland communities, particularly where they occur in field parcels with seepage lines. For example, one parcel of the U4 grassland is found within a mosaic of M25 mire and an M6 mire, and a large 20 ha parcel of U5 grassland is within a mosaic of M23 rush pasture.

Neutral Grasslands (MG3, MG5 and MG8) – 16.5 ha of species-rich neutral grassland still remain within the West Pennine Moors (see photograph 8 in section 9). The site supports areas of the botanically rich NVC type MG3 sweet vernal-grass *Anthoxanthum odoratum* – wood crane's-bill *Geranium sylvaticum* grassland and MG8 crested dog's-tail *Cynosurus cristatus* – marsh-marigold *Caltha palustris* grassland. These grassland areas tend to be small in size and scattered, existing as a series of steep field slopes along valleys. However, two sizable units survive comprising unimproved and semi-improved swards, comprising areas of MG5 crested dog's-tail *Cynosurus cristatus* – common knapweed *Centaurea nigra* grassland in mosaic with less species-rich swards such as MG6 perennial rye-grass *Lolium perenne* – crested dog's-tail *Cynosurus cristatus* grassland and MG10 Yorkshire-fog *Holcus lanatus* – soft-rush *Juncus effusus* rush pasture.

Mire grasslands and rush pastures (M23, M25 and M26) – 112 ha of rush pasture and mire grasslands occur within the moorland fringe of the West Pennine Moors and below 300m altitude. The M23 rush pasture and M25 mire both occupy more than 5 ha in extent and, therefore, have been included. The M26 mire is greater than 0.5 ha and, as this habitat is nationally rare, this is sufficient area to warrant its inclusion. The rush pastures and mires have high levels of connectivity with the upland mosaic and, as such, some parcels straddle the moorland line, particularly where

they occur in mosaic with each other and with M6 mires. In majority of cases, though, these communities represent the lowland downslope habitat of the numerous upland flush communities, as well as providing key marshy habitat for many upland waders.

The Grassland Guidelines (Chapter 3, section 4.7) also state that:

> 'The NVC grassland communities listed in section B of Annex 1 are generally modified types of lower botanical interest. These should not be used as the basis for SSSI selection unless they have rare plant species or assemblages or special faunal interest (MG9, MG10, MG11 and MG13 may do so, in particular). They can, however, be included within an SSSI where they form a mosaic with more important communities or as part of a practical management unit.'

As described above, the lowland grasslands of interest within the SSSI include stands of communities that are of generally lower botanical interest, specifically MG6 grassland and MG10 rush-pasture. The MG6 and MG10 have been included where they form a close-knit mosaic with grassland communities of special interest and are subject to the same management as the species-rich communities.

The Guidelines (Part 1 section 5.12.1) acknowledge that sites can develop a substantially greater nature conservation value as a result of appropriate management or natural change over time. They state that:

> 'It is perhaps most appropriate to apply this criterion where part of a site, sometimes consisting of a different habitat, is in a poorer condition than the rest but its inclusion contributes strongly to the overall interest. One example is where the inclusion of a degraded area occurs between two high-quality parts of a compound site and where its restoration might benefit all three elements of the site.'

This is supported in more detail in Guidelines (Chapter 3, section 4.11.3 and section 5.2).

> 'They provide additional ecological coherence and functionality by contributing to a network in the sense of Lawton *et al.,* (2010). For example, such sites might be adjacent to or near existing semi-natural grassland sites, add to more dispersed habitat networks or be juxtaposed to land that has high restoration potential, enabling potential site expansion and linkages or increasing connectivity at the landscape scale.'

> '….where recent survey has recorded a community listed in section B of Annex 1 … but a survey within the last ten years demonstrated the former presence there of notifiable grassland type, then inclusion of this area within a proposed site may be considered. This would be confined to situations where the grassland of the types listed in section B of Annex 1 is adjacent to types of high botanical interest (section A of Annex 1), such as in contiguous fields, or where a grassland area occurs between two high-quality parts of a compound site and where its restoration might benefit all three elements of the site.'

In addition to the above argument for including areas of less botanically diverse grassland, there are strong indications that a number of these MG6 stands are more species-rich than initially thought, have occasional positive indicator herbs and act as transitional plant communities. More pertinently, the frequency of positive indicators suggests that these grasslands have potential to be restored to a more species-rich MG3 community. These areas comprise 5.6 ha. Additionally, some of the more semi-improved swards are still moderately diverse in flowering plants and provide an important seed source for species such as twite.

3.4 Flowering plants

The West Pennine Moors mosaic of habitats supports three species which meet the guidelines for SSSI selection.

The Guidelines state (Chapter 11, section 3.1):

> 'Schedule 8 Species - All sites with viable populations should be selected'.

The Schedule 8 floating water-plantain *Luronium natans* (also Nationally Scarce) is found in one small pool at the discussed Troy Quarry (see photograph 11 in section 9). The quarry holds the only known viable population of floating water-plantain in the Southern Pennines NCA.

The western pool within the quarry is approximately 140m² and in this pool is a fairly large raft of floating water-plantain towards the southern end of the pool, with a number of small patches scattered throughout the pool to the north. In 2014 the estimated extent of floating water-plantain in this pool was between 10-12m². The population was flowering at the time of survey.

In addition, the Guidelines states (Chapter 11, section 3.2):

> 'Red Databook Species - all RDB species' localities should be regarded as candidate sites. One RDB species qualifies a site for selection if it has…..3.2.5 the only occurrence of the species in the particular AoS.'

Please note: At the time of the 1989 guidelines Red Data Book (RDB) species were all Nationally Rare species, recorded from 1-15 10km squares in GB. The Red List now uses criteria other than just rarity, therefore qualifying species included in the designation are only those considered 'Nationally Rare'.

The West Pennine Moors SSSI supports populations of the Nationally Rare starry lady's-mantle *Alchemilla acutiloba* and large-toothed lady's-mantle *A. subcrenata*. These species are associated with the MG5 neutral grassland habitat. The West Pennine Moors holds the only known populations of these lady's-mantles in the Southern Pennines NCA and therefore qualifies in this respect.

3.5 Breeding birds

In addition to the nationally important assemblages of breeding birds described above, the SSSI is also used by nationally important numbers of gulls and has a large heronry.

The Guidelines (Chapter 17, section 3.2) state that:

> 'Localities which regularly support 1% or more of the total British breeding population of any native species…will qualify for SSSI selection.'

In the five-year period 2010-2014 surveys of the Belmont Reservoir gull colony (see photograph 12 in section 9) by land-based counts and aerial photographs estimated an average of 7,673 pairs of black-headed gulls *Chroicocephalus ridibundus*, which is 5.9% of the GB breeding population (Musgrove *et al.,* 2013). The colony has grown rapidly since 2002. Numbers are increasing at the reservoir (10,136 apparently occupied nests, data from United Utilities 2014 report) and Belmont Reservoir currently supports what is probably the largest black-headed gull colony in Britain.

In the five-year period 2010-2014 Belmont Reservoir supported an average of 18 breeding pairs of Mediterranean gull, which is 3% of the GB breeding population (Musgrove et al. 2013). Numbers are increasing at the reservoir from a single pair in 2005 and, with at least 41 pairs active on nests in 2014 (data from United Utilities 2014 report), Belmont Reservoir is probably the largest inland colony of Mediterranean gulls *Larus ridibundus* in Britain.

The Guidelines (Chapter 17, section 3.5) state that:

> 'The largest colony of a colonial sea bird species, herons or sand martins in the Area of Search...will qualify for SSSI selection. Colonies must hold more than 10 pairs of the species concerned to qualify.'

The West Pennine Moors is home to the largest heronry in the Southern Pennines NCA. Lower House Plantation located on the edge of Turton and Entwistle Reservoir has supported between 28 and 44 pairs of grey heron *Ardea cinerea* since 2003 (36 pairs in 2014). This heronry is considerably larger than the two other active heronries in and adjacent to the SSSI.

4. Site boundary determination

The Guidelines (Chapter 9, section 4.3) state that:

> ‘The aim should be to select a topographic unit as complete as possible….so that it runs from the highest to the lowest feasible elevation, in relation to all directional aspects. Ideally, this means representing all the different catchments which drain from the main watershed, down to the point at which open hill ground changes to enclosed farmland or planation woodland.’

In addition, the guidelines state (Part 1, section 8.8) state:

> ‘The guiding principles for [extensive habitats] and cases are that:
>
> - The diversity characteristic of the habitat in question in the Area of Search must be fully represented in the selected site(s),
> - The extent of sites designated must ensure the safeguarding of an adequate amount of all the features concerned,
> - Ecological units should not be fragmented by designation or administrative boundaries,
> - The areas must be sufficient to meet international obligations for habitat and species conservation.’

The West Pennine Moors SSSI comprises three distinct upland blocks:

- Withnell, Anglezarke and Rivington Moors to the west of the site;
- Darwen and Turton Moors in the centre of the site; and
- Haslingden, Oswaldtwistle and Holcombe Moors to the east of the site.

These upland blocks comprise the core of the site and are chosen because they contain the most intact peatlands in the AoS. These areas incorporate mosaics of upland habitat, particularly blanket bog, within large management units. The three upland blocks are separated and surrounded by improved agricultural land, reservoirs, conifer plantations and urban settlements, which have generally been excluded from the SSSI. The western and central upland blocks lie in close proximity to each other and are linked ecologically by the wetland features around Belmont. The eastern upland area is slightly apart from the remaining site (about 5 km between Turton Moor and Edgerton Moss) but is linked by the smaller and lower-lying peatland expanses of Cranberry Moss and Hoddlesden Moss. Hence, there is no more than 0.5 km between these upland habitats that share a common underlying geology and, as a result, they are considered to function as a single ecological and topographical unit.

In accordance with the Guidelines, all continuous or near-continuous areas of upland moorland vegetation have been included within the boundary, either on the basis of their botanical interest, their hydrological and topographical connectivity, and/or their interest for birds. In combination, these habitats provide the full representation of upland habitats in the area and ecological functions across the interdependent elements of hydrologically-linked units.

Contiguous enclosed land on the periphery of the moorland blocks, including moorland fringe or in-bye grassland and woodlands at lower altitudes, is included where it is of sufficient quality to have biological interest. Species-rich hay meadows and acid grasslands as well as good quality rush pastures and mire grasslands complete the compliment of habitats within the topographic unit, providing a representation of habitats running from high moorland to valley bottom.

All habitats within the SSSI boundary support important upland, in-bye and woodland breeding bird assemblages which depend on a wide variety of habitat features. Many bird species nest in one habitat and often forage in others commonly some distance away from nesting locations. For example, twite and golden plover both breed in the open uplands, one in structurally diverse heathlands and the other on short blanket bog vegetation, but often feed in neighbouring moorland fringe areas (seed-rich meadows and pastures respectively). The SSSI boundary has been determined to meet breeding and feeding requirements of the breeding birds within the site.

The approach taken above has then been practically applied so that, wherever possible for reasons of ecological integrity, practicality and ease of identification, the boundary of the SSSI has been drawn to follow the nearest physical feature on the ground. This usually follows existing walls, fence lines, hedgerows, ditches, drains, drove roads and metalled roads. Where the boundary follows a road, the inner edge of the road has been used and the road has therefore been

excluded from the site. Conversely, where the boundary is drawn to a stream, ditch or drain, the outer bank has been used therefore including the stream, ditch or drain in the site. The site is, therefore, physically bounded by ditches, drains, hedgerows, fences and drove roads as well as metalled roads.

The Guidelines (Part 1, section 8.12) state that:

> 'Artificial habitats and structures - In general, large conifer plantations will normally be excluded from SSSIs, because they are artificial habitats, unless they support particular species features…'

A single conifer plantation on the banks of Turton and Entwistle reservoir has been included because it supports a large heronry. Equally, Belmont Reservoir, has been included within the SSSI boundary because it supports nationally important populations of breeding gulls and Troy Quarry is included because it supports a population of the floating water-plantain.

5. Assessment of the current condition of the West Pennine Moors SSSI

Unit *	Interest features	Reported condition **	Date of last assessment ***
1	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
2	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
3	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - recovering	17th December 2013
4	Dwarf shrub heath, upland habitat for birds	Unfavourable - recovering	17th December 2013
5	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - recovering	17th December 2013
6	Dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
7	Bogs, upland habitat for birds	Unfavourable - no change	17th December 2013
8	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
9	Bogs, upland habitat for birds	Unfavourable - no change	17th December 2013
10	Bogs, upland habitat for birds	Unfavourable - no change	17th December 2013
11	Bogs, upland habitat for birds	Unfavourable - recovering	17th December 2013
12	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
13	Bogs, upland habitat for birds	Unfavourable - declining	17th December 2013
14	Flowering plants, upland habitat for birds	Favourable	13th October 2014
15	Bogs, upland habitat for birds	Unfavourable - recovering	17th December 2013
16	Bogs, upland habitat for birds	Unfavourable - no change	17th December 2013
17	Bogs, upland habitat for birds	Unfavourable - no change	17th December 2013
18	Bogs, upland habitat for birds	Unfavourable - no change	17th December 2013
19	Upland habitat for birds	Favourable	31st August 2012

Unit *	Interest features	Reported condition **	Date of last assessment ***
20	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - recovering	17th December 2013
21	Bogs, dwarf shrub heath, acid grassland, upland habitat for birds	Unfavourable - recovering	17th December 2013
22	Herons	Favourable	13th May 2014
23	Neutral grassland, flowering plants, upland habitat for birds	Unfavourable - declining	17th December 2013
24	Bogs, upland habitat for birds	Unfavourable - recovering	17th December 2013
25	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
26	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
27	Dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
28	Dwarf shrub heath, upland habitat for birds	Favourable	17th December 2013
29	Upland habitat for birds	Favourable	31st August 2012
30	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
31	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
32	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
33	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
34	Upland habitat for birds	Favourable	31st August 2012
35	Breeding gulls	Favourable	29th July 2014
36	Upland habitat for birds	Favourable	31st August 2012
37	Fen, marsh & swamp	Unfavourable - declining	17th December 2013
38	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - declining	17th December 2013
39	Woodland, woodland birds, fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	30th September 2014
40	Fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
41	Woodland	Unfavourable - no change	19th August 2013
42	Woodland birds	Favourable	2nd September 2014
43	Bogs, upland habitat for birds	Unfavourable - recovering	17th December 2013
44	Bogs, dwarf shrub heath, acid grassland, upland habitat for birds	Unfavourable - no change	17th December 2013
45	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013

Unit *	Interest features	Reported condition **	Date of last assessment ***
46	Dwarf shrub heath, woodland woodland birds	Unfavourable - no change	2nd September 2014
47	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds, woodland, woodland birds	Unfavourable - recovering	2nd September 2014
48	Bogs, upland habitat for birds	Unfavourable - recovering	17th December 2013
49	Acid grassland, upland habitat for birds, woodland, woodland birds	Unfavourable - no change	2nd September 2014
50	Bogs, fen, marsh & swamp, acid grassland, upland habitat for birds	Unfavourable - declining	17th December 2013
51	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - declining	17th December 2013
52	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
53	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
54	Bogs, dwarf shrub heath, fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
55	Bogs, dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
56	Dwarf shrub heath, upland habitat for birds	Unfavourable - no change	17th December 2013
57	Bogs, upland habitat for birds	Unfavourable - no change	17th December 2013
58	Fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
59	Upland habitat for birds	Favourable	31st August 2012
60	Fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
61	Woodland, woodland birds	Unfavourable - no change	2nd September 2014
62	Fen, marsh & swamp, upland habitat for birds	Favourable	21st August 2014
63	Fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
64	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
65	Fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
66	Fen, marsh & swamp, upland habitat for birds	Unfavourable - no change	17th December 2013
67	Neutral grassland, upland habitat for birds	Unfavourable - no change	17th December 2013
68	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
69	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
70	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - declining	17th December 2013

Unit *	Interest features	Reported condition **	Date of last assessment ***
71	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
72	Fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
73	Neutral grassland, upland habitat for birds	Favourable	17th December 2013
74	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
75	Bogs, fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
76	Fen, marsh & swamp, woodland, upland habitat for birds	Unfavourable - recovering	17th December 2013
77	Bogs, upland habitat for birds	Unfavourable - recovering	17th December 2013
78	Fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013
79	Fen, marsh & swamp, upland habitat for birds	Unfavourable - recovering	17th December 2013

* **Site units** are divisions used by Natural England for administrative purposes only.

** **Reported condition**

SSSIs are notified because of special biological or geological features. When these features are being managed so that their special nature conservation interest is being maintained they are said to be in favourable condition. This is a United Kingdom standard and the terminology and definitions are more fully described in 'A Statement on Common Standards Monitoring', produced by the Joint Nature Conservation Committee in 1998.

*** **Date of last assessment**

Condition assessment for habitats dated 17th December 2013 is derived from a report delivered during 2013 but based on NVC survey data obtained during May to September 2012.

Reasons for adverse condition

Condition category	Number of units	Area covered by assessment
Favourable	12	475.43 ha
Unfavourable – recovering	30	4,217.26 ha
Unfavourable – no change	30	2,413.31 ha
Unfavourable – declining	7	556.77 ha

The majority of the West Pennine Moors is currently either in 'favourable' or 'unfavourable recovering' condition. Like many upland areas in England, the habitats have historically been adversely affected by a number of interrelated factors including over-grazing, wildfires, drainage and erosion. However, significant recovery has already been achieved on large tracts of blanket bog habitat, most recently through the United Utilities Sustainable Catchment Management Programme (SCaMP), which identified measures, secured funding and facilitated a joint co-ordinated approach to management with Natural England. As a result, many agri-environment agreements are addressing reasons for adverse condition on United Utilities land and are having beneficial impacts on upland habitats and species.

Units assessed as being in 'unfavourable no change' condition are predominantly smaller units in private ownership that were not in a position to benefit from the SCaMP restoration programme and may not have had access to funding prior to SSSI status being conferred on the area. Natural England will be working with farmers and land managers in these areas to expand the coverage of similar beneficial land management through administering and negotiating future agri-environment schemes.

The unfavourable declining assessment has been assigned to a small number of units for the following reasons:

- current over-grazing combined with heavy recreational activity;
- lack of active management to address scrub and rush invasion;
- non-compliance with Higher Level Stewardship options for species-rich grassland; and
- inappropriate planting of new upland woodlands.

Natural England is currently working with these land owners in the West Pennine Moors to ensure that management practices promote the conservation of all its habitat features and bird interest. It is envisaged that agri-environment schemes will continue to be the primary mechanism for the delivery of beneficial management but we will be exploring and maximising the use of a range of opportunities arising from partnership working and other funding initiatives.

6. Selection of 'operations requiring Natural England's consent'

To achieve positive management of the SSSI owners and occupiers will require consent before undertaking some operations to safeguard the special features of SSSI. These operations are known as Operations requiring Natural England Consent.

When determining the list of operations requiring consent for individual SSSIs, relevant operations are identified from a Natural England master list. Selection is based on the likelihood that the operations may cause damage to the special features that are the reasons for notification of the SSSI. As well as selecting operations from the master list the precise wording of each operation may be tailored to suit the particular circumstances at the site.

It is not possible to predict every possible eventuality that may arise on a site but the aim is to identify all operations where it is reasonably foreseeable that, if carried out at certain times or in a particular manner somewhere within the SSSI, they are likely to damage the special interest features. The table below records at least one reason justifying the inclusion of each operation in the list for West Pennine Moors SSSI. It is not intended to be exhaustive and in most cases there will be other ways in which the specified operation is likely to cause damage.

Standard reference number	Type of operation	At least one reason for listing
1.	Cultivation, including ploughing, rotovating, harrowing and re-seeding.	Important habitats and associated flora/fauna could be destroyed.
2.	Grazing and alterations to the grazing regime (including type of stock, intensity or seasonal pattern of grazing).	Important habitats and associated flora/fauna sensitive to over or under grazing.
3.	Stock feeding and alterations to stock feeding practice.	Could lead to localised nutrient enrichment or poaching which would damage important habitats and associated flora/fauna.
4.	Mowing or cutting vegetation and alterations to the mowing or cutting regime (such as from haymaking to silage).	Important habitats and associated flora/fauna sensitive to mowing or cutting.
5.	Application of manure, slurry, silage liquor, fertilisers and lime.	Important habitats and associated flora/fauna sensitive to nutrient enrichment.
6.	Application of pesticides, including herbicides (weedkillers) whether terrestrial or aquatic, and veterinary products.	Important habitats and associated flora/fauna all sensitive to these.
7.	Dumping, spreading or discharging of any materials.	Risk of obscuring/smothering important habitats and associated flora/fauna.

Standard reference number	Type of operation	At least one reason for listing
8.	Burning and alterations to the pattern or frequency of burning.	Upland habitats sensitive to burning.
9.	Release into the site of any wild, feral, captive-bred or domestic animal, plant, seed or micro-organism (including genetically modified organisms).	Could lead to unforeseen interactions with indigenous species and changes in community composition.
10.	Killing, injuring, taking or removal of any wild animal (including dead animals or parts thereof), or their eggs and nests, including pest control and disturbing them in their places of shelter.	Could lead to unforeseen changes in community composition and direct damage to notified bird populations.
11.	Destruction, displacement, removal or cutting of any plant, fungus or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungal fruiting body, leaf-mould, turf or peat.	Damage to important habitats and associated flora/fauna.
12.	Tree and/or woodland management and alterations to tree and/or woodland management (including planting, felling, pruning and tree surgery, thinning, coppicing, changes in species composition, removal of fallen timber).	Direct damage to woodland feature and risk of indirect damage to other features, especially breeding bird assemblages.
13a	Draining (including moor-gripping, the use of mole, tile, tunnel or other artificial drains).	Upland habitats and associated flora/fauna sensitive to drainage.
13b.	Modification to the structure of water courses (streams, springs, ditches, dykes, drains), including their banks and beds, as by re-alignment, re-grading, infilling, damming or dredging.	Could alter drainage and have a direct impact on important habitats and associated flora/fauna in the immediate vicinity or downstream of works.
13c.	Management of aquatic and bank vegetation for drainage purposes.	Direct damage to important habitats and associated flora/fauna.
14.	Alterations to water levels, water tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes). Also the modification of current drainage operation through the installation of new pumps.	Upland habitats sensitive to water levels.
15.	Infilling or digging of ditches, dykes, drains, ponds, pools, marshes or pits.	Direct damage to important wetland habitats and associated flora/fauna.
16a.	Freshwater fishery production and/or management, including sporting fishing and angling, and alterations to freshwater fishery production and/or management.	Direct damage to plant or bird populations. Indirect damage to habitats around the open waters.
20.	Extraction of minerals including peat, shingle, hard rock, sand and gravel, topsoil, subsoil, and spoil.	Direct loss of important habitats and associated flora/fauna.
21.	Destruction, construction, removal, re-routing, or re-grading of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, including soil and soft rock exposures or the laying, maintenance or removal of pipelines and cables, above or below ground.	Direct loss of or incidental damage to important habitats and associated flora/fauna.

Standard reference number	Type of operation	At least one reason for listing
22.	Storage of materials on blanket bog, heathland, flushes, rush pastures, mire grasslands, species-rich meadows or pastures or in woodlands.	Risk of obscuring/smothering important habitats and associated flora/fauna.
23.	Erection of permanent or temporary structures or the undertaking of engineering works, including drilling.	Direct loss of or incidental damage to important habitats and associated flora/fauna.
24a.	Modification of natural or man-made features (including cave entrances) and clearance of boulders, large stones, loose rock or scree.	Direct loss of or incidental damage to important habitats and associated flora/fauna.
24b.	Battering, buttressing or grading of geological exposures and cuttings (rock and soil) and infilling of pits and quarries.	Direct loss of or incidental damage to important habitats and associated flora/fauna.
26.	Use of vehicles or craft other than on made-up roads or tracks.	Risk of direct damage to important habitats and associated flora/fauna.
27.	Recreational or other activities likely to damage or disturb the interest features of special interest.	Risk of direct damage to important habitats and associated flora/fauna.
28a.	Game and waterfowl management and hunting practices and alterations to game and waterfowl management and hunting practice.	Inappropriate location and types could damage important habitats and associated flora/fauna.
28b.	Use of lead shot.	Several breeding birds (including water birds and game birds), are vulnerable to lead poisoning through accidental ingestion with grit or secondary ingestion by predatory and scavenging species (including raptors, owls and corvids).

7. Site unit maps

The maps on the following pages show the provisional boundaries of the site units, which are divisions used by Natural England for administrative purposes only.

8. Distribution of priority habitats and other features within the West Pennine Moors

Simple maps of the site showing where the key habitats are located.

9. Photographs

Photograph 1: Blanket bog habitats on Wet Moss viewed from Bull Hill

Photograph 2: Blanket bog habitats transition into wet heath and dry heath on Wheelton Moor, combining into an upland mosaic

Photograph 3: Dwarf shrub heath communities close to a wooded clough on the edge of Smithills Moor

Photograph 4: One of the calcareous flush communities at White Coppice Flush, where base-rich water seeps from the underlying acid geology creating a unusual mix of acid and alkaline environments and supporting scarce plants such as sundews and butterwort

Photograph 5: The mosaic of upland and moorland fringe habitats of heathland, acid grassland, rushy flushes and woodland fringes of Haslingden Grane and Musbury Heights, viewed from Edgerton Moss, support a diverse range of breeding birds

Photograph 6: Woodland is scarce in the West Pennine Moors. Longworth Clough, as seen here from Great Robert Hill, provides relict stands of ancient semi-natural woodland

Photograph 7: Relict clough woodland with remnant heath at Slipper Lowe, South Roddlesworth, supports an assemblage of woodland breeding birds, especially those using both wooded and neighbouring open habitats

Photograph 8: One of the remnant neutral grassland meadows of the West Pennine Moors at Sunnyhurst Meadows near Earnsdale Reservoir. These meadows are also home to two rare species of lady's mantles.

Photograph 9: Moorland fringe acid grassland at Sugar Leach, viewed from Cadshaw Clough east of Turton Moor. Some areas of acid grassland are more species rich than others. In many cases acid grassland has been included because it provides nesting or feeding habitat for breeding birds

Photograph 10: Oak Field is situated on the lower edge of Turton Moor and is one of the best examples of an acid flush and wet grassland mosaic

Photograph 11: The western pool at Troy Quarry is home to a population of the protected floating water-plantain (Photograph courtesy of G. Skelcher)

Photograph 12: The island on Belmont Reservoir to the east of Winter Hill holds nationally important numbers of breeding Black-headed and Mediterranean gulls

Photograph 13: Aerial Photo