REVISED GUIDELINES FOR SELECTION OF BIOLOGICAL HERITAGE SITES (2007)

(These Guidelines relating to bog habitat replace those in the Biological Heritage Sites Guidelines for Site Selection, published in 1998)

6.5 BOG

Application (all bog guidelines)

Bogs receive their water and nutrients primarily from rainfall and not from groundwater sources (cf. swamp and fen). They include lowland raised bog (mossland) and the upland (in England) blanket bog, as defined in JNCC (1994). However, the term 'blanket bog' may be appropriately replaced by 'blanket mire' to describe the expansive areas of this habitat in the uplands where there is water movement over or through large areas of blanket peat or from mineral rock/soil intrusions.

Bogs would naturally have a distinctive type of peat-forming vegetation composed of acid-loving plants, especially *Sphagnum* mosses, on peat 0.5m or more in deep. This peat depth is normally used to distinguish bog from heath, which rarely achieves this depth. Due to human activities, as elsewhere, bogs in Lancashire are modified or degraded to a lesser or greater extent. As a consequence their vegetation may be sub-optimal and peat depths may be somewhat reduced.

Bogs supporting a significant area of vegetation that is normally peat-forming are defined as 'Active' (JNCC 2005), and typically, include 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. Such peat-forming vegetation occurs over bogs in Lancashire, being well represented in upland situations. Active raised bog and Blanket bog are priority habitat types within the EC Council Directive 92/43/EEC (Habitats Directive). . Through the Directive, the Annex 1 feature, Raised mire, assumes a unique status in that they can be designated as Special Areas of Conservation (SACs) on their potential to resume peat formation if managed correctly (Jackson, D.L. & McLeod, C.R. Eds, 2000). In terms of Biological Heritage Sites this potential is extended to Blanket bogs. In this respect the guidelines not only aim to select and safeguard all remnants supporting distinctive vegetation but also those with the potential to become active bogs through appropriate management.

Lowland raised bogs in Lancashire generally survive as relict well-defined features in an otherwise significantly modified landscape. Three mesotopes (JNCC 1994), Flood-plain raised bog, Estuarine raised mire and Basin raised bog, may be represented in Lancashire. However, relict Lowland raised bog is now so rare in Lancashire that all surviving examples are considered important. In upland Lancashire Blanket bog is better represented and comprises four hydrological types, Watershed Mire, Valleyside Mire, Spur Mire and Saddle Mire mesotopes; the Waterside-valleyside Mire mesotope is also present (JNCC 1994). Site boundaries should seek to reflect the integrity of the peat body in terms of either one or more mesotopes, large scale topographical features or other physical boundaries, whichever is considered most appropriate. Areas of thinner peat contiguous to or occurring locally within a bog may be included within sites where it is considered they form an integral part of the bog or where the land is considered important in terms of contributing to the hydrological integrity.

Intermediate mires, those showing characteristics of both Lowland raised mire and Blanket bog, may be selected under whichever bog guideline is considered appropriate.

Justification (all bog guidelines)

The bogs of north and west Britain are collectively of international nature conservation significance, with a selection having SSSI, SAC and Ramsar designations. In the lowlands most of Lancashire's bogs (mossland or lowland raised mire) have been either destroyed or else degraded. In the uplands more extensive tracts of bog (blanket bog or mire) remain but these also have been modified to a lesser or greater extent. Nevertheless Lancashire still retains a significant proportion of the English resource and its conservation and restoration is important in delivering UK BAP targets. As a formerly widespread and characteristic natural feature of Lancashire, they are of high nature conservation importance because of what they represent in terms of habitat history, structure and function, and for their flora and fauna. The importance of bogs as carbon stores is now widely recognised and increases their conservation importance. Together with some fens, they are collectively the most long-term sinks of atmospheric carbon dioxide but will remain net contributors to the atmosphere unless peat is once more enabled to form. Whilst selecting bogs for their intrinsic biodiversity value, these guidelines also aim to identify all viable remnants that, under favourable management, would be capable of peat formation.

Both Lowland raised mire and Blanket bog are UK Biodiversity Action Plan Priority Habitats, their selection as sites is an integral part of BAP delivery.

Bo1	**Lowland bog (mossland) sites over 0.5 hectare in extent which support semi-natural vegetation.**

Application

All sites supporting semi-natural vegetation should be selected and may include cut-over, drained or afforested bog.

Justification

About 98% of lowland raised mosses of Lancashire have now been reclaimed for agriculture or otherwise lost (Lancashire County Council n.d.). The habitat is now so rare that all uncultivated remnants (whether they are cut over and regenerated or not) larger than 0.5 hectare are considered to be of importance, a key part of the County's "critical environmental capital"(see Introduction, para. 2.1).

Bo2 (a)	**Bog sites with at least 25% cover of *Sphagnum* (bog-moss) over a minimum area of 0.5 hectare.**

Application

This guideline may be applied either to relict areas of *Sphagnum* cover, or areas of regenerating *Sphagnum* cover.

Justification

Bogs with a high percentage of Sphagnum cover indicate either relatively little disturbance in the past or a regenerating bog-moss surface following the onset of more favourable local environmental conditions.

Sphagnum mosses are lost from bogs subject to systematic drainage and/or burning. They provide the building material and habitat matrix for 'classical' raised and blanket bogs which support a number of rare and decreasing species (including rare species of *Sphagnum* itself)

Bo2 (b) Bog sites supporting 8 or more species of *Sphagnum* mosses.

Application

This guideline may be applied to any area of bog (Lowland raised bog or Blanket mire) supporting 8 or more species of *Sphagnum* mosses. A list of species associated with such habitats in Lancashire includes:

Sphagnum capillifolium	Red and Acute-leaved Bog-moss
Sphagnum cuspidatum	Feathery Bog-moss
Sphagnum denticulatum	Cow-horn Bog-moss
Sphagnum fallax	Flat-topped Bog-moss
Sphagnum fimbriatum	Fringed Bog-moss
Sphagnum flexuosum	Flexuous Bog-moss
Sphagnum girgensohnii	Girgensohn's Bog-moss
Sphagnum magellanicum	Magellanic Bog-moss
Sphagnum palustre	Blunt-leaved Bog-moss
Sphagnum papillosum	Papillose Bog-moss
Sphagnum russowii	Russow's Bog-moss
Sphagnum squarrosum	Spiky Bog-moss
Sphagnum subnitens	Lustrous Bog-moss
Sphagnum tenellum	Soft Bog-moss

Justification

Bogs supporting a diversity of *Sphagnum* mosses are indicative of better quality habitat with a range of surface or structural features. As stated under Bo2(a) they may indicate bogs with relatively little past disturbance or be associated with regenerating bogs where more favourable conditions prevail. Whilst certain species are associated with different types of wetter bog-pools or silting-up 'grips', others are associated with vegetation on 'drier' bog surfaces. Very often their frequency may be obscured by growing beneath and between hummocks of Purple Moor-grass (*Molinia caerulea*) making an assessment of their abundance (as in Bo2(a)) near impossible.

Bo3 (a) Bog containing 3 or more species in Table 3a

Application

Species listed need only be present, irrespective of their abundance or distribution on the site concerned.

Justification (unchanged)

Few, if any, of the listed species will occur in those bogs which have been severely degraded by drainage, burning and heavy grazing. They are valuable indicators of more natural conditions which are now rare in Lancashire's bogs.

Table 3a. Plant species of bogs [1] (See Guideline Bo3a)

Plant species of bogs	Scientific Name	Common Name
	Andromeda polifolia	Bog Rosemary
	Drosera rotundifolia	Round-leaved sundew
	Erica tetralix	Cross-leaved Heath
	Myrica gale	Bog Myrtle
	Narthecium ossifragum	Bog Asphodel
	Trichophorum cespitosum	Deergrass
	Vaccinium oxycoccus	Cranberry

Bo3 (b) Bog containing 3 or more species in Table 3b

Application

Species listed need only be present, irrespective of their abundance or distribution on the site concerned.

Justification

Few, if any, of the listed species occur in those bogs which are severely degraded by drainage, burning and heavy grazing. They are indicators of more natural conditions or situations where more favourable conditions have enabled populations to re-establish.

Table 3b. Plant species of bogs (See Guideline Bo3)

Plant species of bogs	Scientific Name	Common Name
	Sphagnum capillifolium (ssp. *capillifolium* or ssp. *rubellum*)	Acute-leaved Bog-moss or Red Bog-moss
	Sphagnum magellanicum	Magellanic Bog-moss
	Sphagnum papillosum	Papillose Bog-moss
	Sphagnum subnitens ssp. *subnitens*	Lustrous Bog-moss
	Sphagnum tenellum	Soft Bog-moss

Bo4	**Areas greater than 10 hectare in which any of the following dwarf shrubs, either individually or in combination, have more than 25% average cover:** ***Calluna vulgaris*** — **Heather** ***Vaccinium myrtillus*** — **Bilberry** ***Empetrum nigrum*** — **Crowberry**

Application

This guideline should be applied to areas of peat with a depth of at least 0.5 metres; they may be dry through drainage (gripping) or may have been cutover in the past. Whilst dwarf shrubs may dominate some sites, others may comprise mosaics often involving species associated with wetter conditions or acidic grassland. However, some areas dominated by dwarf shrubs are, in fact, mosaics of bog and heathland (see Guideline He 1) and cannot be readily differentiated. Where such areas otherwise comply with the terms of Guideline Bo4 or He1 they may be selected under whichever is the most appropriate guideline.

Justification

Although much modified by human activities, larger areas of drier bog in which dwarf shrubs are a major component are of conservation value in terms of maintaining biodiversity resources of the region. Peripheral areas of thinner peat not readily differentiated from Heath represent a contiguous habitat and are likely to be important to the integrity of the peat mass. They may also represent the historic boundaries of the peat body. These sites contain a significant carbon store.

Bo5	**Areas of upland peat comprising the following topographical or hydrological types of blanket mire mesotopes:** **Watershed mire** — **Spur mire** **Valleyside mire** — **Saddle mire** **Waterside-Valleyside**

Application

Sites should be selected on the basis of topographical or hydrological function in terms of the blanket mire mesotopes in JNCC (1994). This guideline should be applied to those areas of peat (primarily >0.5m) that may not support the quality of vegetation required by the other Bog guidelines (although they will normally support some form of semi-natural vegetation) but nevertheless represent a biodiversity resource in terms of comprising at least one coherent mesotope. Some mire systems are, in fact, mosaics of Bog and Fen habitats, or are intermediate in character, such sites may be considered for inclusion under whichever guideline is the more appropriate.

Justification

Blanket mire is an internationally important habitat with Lancashire supporting an important proportion of the English resource. Whilst blanket mire is valued for the flora and fauna it supports, it is nevertheless important historically and as a store of carbon. Degraded Blanket mires retaining deposits of peat, which given favourable conditions, are considered capable of functioning as active bog, are important for biodiversity and as 'sink' for atmospheric carbon dioxide. In these respects it is considered that such blanket mires should be identified as sites.

References

See main guidelines

Jackson, D.L. & McLeod, C.R. (Editors), (2000), Handbook on the UK status of EC Habitats Directive interest features: provisional data on the UK distribution and extent of Annex I habitats and the UK distribution and population size of Annex II species, Revised 2002, JNCC Report 312, 180 pages, ISSN 0963 8091

JNCC (2005), The Habitats Directive: Selection of Special Areas of Conservation in the UK, JNCC Report 270.
(http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H7130)

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