COUNTY: SHROPSHIRE, CLWYD SITE NAME: FENN'S, WHIXALL, BETTISFIELD, WEM and CADNEY MOSSES

DISTRICT: North Shropshire, Wrexham Maelor

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended.

Local Planning Authority: SHROPSHIRE COUNTY COUNCIL, North Shropshire District Council
CLWYD COUNTY COUNCIL, Wrexham Maelor Borough Council

National Grid Reference: SJ 490365 Area: 948.4 (hc.)

Ordnance Survey Sheet 1:50,000: 126 1:10,000: SJ 43 NE, SJ 43 SE, SJ 53 NW

FENN'S, WHIXALL & BETTISFIELD MOSSES
Date Notified (Under 1949 Act): 1953 Date of Last Revision: 1963 Shropshire, 1978 Clwyd

Date Notified (Under 1981 Act): 1983 Date of Last Revision: 21 March 1994

WEM MOSS
Date Notified (Under 1949 Act): 1963 Date of Last Revision: 1963

Date Notified (Under 1981 Act): 1983 Date of Last Revision: 21 March 1994

Other Information:
Boundary amendment (extensions and deletions). Wem Moss is subject to common rights of grazing. Wem Moss is managed as a Nature Reserve by the Shropshire Wildlife Trust. Site extensions to Fenn's, Whixall and Bettisfield Mosses were notified in 1984.

Description and Reasons for Notification:
The Meres and Mosses of the Clwyd-Shropshire-Cheshire-Staffordshire plain form a nationally and internationally important series of open water and peatland sites. These have developed in natural depressions in the glacial drift left by the ice sheets which covered this plain some 15,000 years ago. The majority lie in Cheshire and north Shropshire, with a small number of outlying sites in adjacent parts of Staffordshire and Clwyd.

The origin of most of the hollows can be accounted for by glaciation but a small number have been formed at least in part by more recent subsidence resulting from the removal in solution of underlying salt deposits.

There are more than 60 open water bodies known as 'meres' or 'pools' and a smaller number of peatland sites or mires known as 'mosses'. The meres range in depth from about one metre to 27 metres and have areas varying between less than a hectare to 70 hectares.

Although the majority of the meres are nutrient rich (eutrophic), the water chemistry is very variable reflecting the heterogeneous nature of the surrounding drift deposits. Associated fringing habitats such as reedswamp, fen, carr and damp pasture add to the value of the meres. The development of these habitats is associated with peat accumulation which in some cases has led to the complete infilling of the basin. During this process the nutrient status of the peat surface changes and typically becomes nutrient poor (oligotrophic) and acidic thus allowing species such as the bog mosses *Sphagnum* spp. to colonise it. The resulting peat bogs are the 'mosses'. In a few cases colonisation of the water surface by

floating vegetation has resulted in the formation of a quaking bog known as a 'schwingmoor'.

Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses together form an outstanding example of a lowland raised mire. The moss complex, which straddles the border between Shropshire, England and Clwyd, Wales, is one of the largest and most southerly raised mires in Britain. The site is highly valued ecologically as an example of mire development occurring under relatively warm and dry conditions and lying at the edge of the British range for this type of habitat.

Although the greater part of the site has a long history of peat extraction, it retains significant areas of partially cut and uncut mire surfaces. These areas are particularly important for their intact paleoecological record stored within the peat and for the presence of a complete range of typical raised mire species including several regional and national rarities. Of especial note is its extensive and exceptional invertebrate fauna.

The presence of an extensive body of peat, which for the most part remains hydrologically intact, and the substantial thickness of residual peat, in parts exceeding 4 metres, provides excellent conditions for rewetting and restoration of active peat forming processes.

The site as a whole supports a wide range of characteristic acid peat bog vegetation including thirteen species of *Sphagnum* moss, notably *S. cuspidatum*, *S. subnitens*, *S. papillosum* and *S. magellanicum* which represent successional stages in the development of a raised mire.

The distribution and abundance of these and other typical peatland species is determined in part by the degree of past disturbance resulting from peat cutting activities.

The central area comprising a large proportion of Fenn's Moss has been intensively drained and until recently was subject to commercial peat extraction. This area is characterised by a regular pattern of baulks and hollows, in which the hollows are largely devoid of vegetation. With the recent installation of dams and the raising of water levels, many of these hollows are being colonised by the bog moss *S. cuspidatum*. On the dry upstanding baulks the vegetation is dominated by heather *Calluna vulgaris* with purple moor-grass *Molinia caerulea* and cross-leaved heath *Erica tetralix*, in parts colonised by birch *Betula* spp. and Scot's pine *Pinus sylvestris*. Although the botanical interest of this part of the site is relatively low, the conservation of this area is fundamental to maintaining the hydrological integrity of the site as a whole.

Most of Whixall Moss and the northern and marginal areas of Fenn's Moss have been partially worked for peat and show an irregular pattern of peat baulks and hollows. Some of these workings are abandoned and have become revegetated, while others are currently being worked by hand on a small scale by local individuals. These areas are some of the most valuable parts of the moss complex for wildlife, supporting a full range of raised mire species. Large expanses are dominated by heather with purple moor-grass and cross-leaved heath, which in damper areas has a continuous ground cover of bog mosses *Sphagnum* spp. The acidic vegetation includes round-leaved sundew *Drosera rotundifolia*, cranberry *Vaccinium oxycoccus*, bog asphodel *Narthecium ossifragum*, white beak-sedge *Rhynchospora alba* and the nationally rare bog-rosemary *Andromeda polifolia* in some abundance. In the least disturbed areas, *Sphagnum* hummocks, particularly of *S. papillosum* and *S. magellanicum* persist as remnants of the hummock/hollow microtopography typical of undisturbed raised mires. Wet hollows and old abandoned cuttings have been colonised by the bog mosses *Sphagnum* spp., common cottongrass *Eriophorum angustifolium*, hare's-tail cottongrass *E. vaginatum* and in one or two cuttings by lesser bladderwort *Utricularia minor* occurring here at its only known Shropshire locality. The bryophyte flora, which is especially varied, includes the nationally scarce species *Dicranum affine* and *Sphagnum pulchrum*.

Small examples of uncut mire survive at Oaf's Orchard, the Cranberry Beds, adjacent to the Shropshire Union Canal, and around the margins of Fenn's and Whixall Moss. In addition to supporting a range of raised mire species, these areas are especially important as examples of original mire surface and for their complete paleoecological record.

Bettisfield Moss (and Wem and Cadney Mosses to the south) are part of the same peat body as Fenn's and Whixall Mosses. They are now separated physically, and possibly hydrologically also, from the rest of the mire by the Shropshire Union Canal. A large proportion of Bettisfield Moss is covered with birch scrub and Scot's pine of varying ages. In parts the pine trees are mature and form a continuous canopy. Beneath this cover, however, survives the full range of typical mire species with, in open and wetter areas, species such as *Sphagnum magellanicum*, cranberry, bog-rosemary, white beak-sedge, crowberry *Empetrum nigrum*, hare's-tail cottongrass and royal fern *Osmunda regalis*. These areas represent some of the best examples of undisturbed raised mire surface on the SSSI.

Wem and Cadney Mosses represents the southern-most extent of the mire complex. Whilst this part of the site has been affected by lowered water tables, it has not been cut for peat and Wem Moss represents the largest extent of the complex which retains its mire surface intact. The central part of Wem Moss consists mainly of acidic bog with abundant cross-leaved heath and heather. Damp hollows are dominated by bog mosses *Sphagnum* spp. and contain a range of uncommon mire plants similar to those found elsewhere on the site , such as bog-rosemary, cranberry and white beak-sedge, and additionally all three British species of sundew, *Drosera anglica, D. intermedia* and *D. rotundifolia*. Running across the centre of the moss, occupying a slightly lower lying area, is a strip of fen in which bog-myrtle *Myrica gale* and purple moor-grass are predominant. Royal fern occurs in this habitat. Other areas of *Molinia* fen contain small quantities of meadow thistle *Cirsium dissectum* found here at its only Shropshire locality, and lesser butterfly-orchid *Platanthera bifolia*.

In the north and north east of Fenn's Moss and at scattered locations elsewhere on and around the mire are examples of lowland heath vegetation which are dominated by heather and bilberry *Vaccinium myrtillus* and locally cowberry *V. vitis-idaea*, frequently being invaded by birch and bracken, and where raised mire species are poorly represented. The southern margin of the peat body has been used agriculturally resulting in the development of peaty pasture which supports botanically diverse acidic, neutral and marshy grassland communities.

On either side of the Shropshire Union Canal and around the margins of Wem Moss is a distinct and mainly wooded 'lagg'. These areas are influenced by nutrient-rich drainage water seeping from the canal or, in the case of Wem Moss, from surrounding mineral ground. The damp woodland is characterised by abundant alder *Alnus glutinosa* and sallow *Salix cinerea* and contains the uncommon alder buckthorn *Frangula alnus*, the food plant for the brimstone butterfly *Gonepteryx rhamni* which is extremely rare in North Wales.

The invertebrate fauna of the whole raised mire is exceptionally diverse including 168 Notable species and 29 Red Data Book species. The site is of national importance for several insect groups including Diptera (flies), Lepidoptera (butterflies and moths) and Coleoptera (beetles). Twenty one species of Odonata (dragonflies/damselflies) have been recorded, including the nationally rare species white faced darter *Leucorrhinia dubia* and variable damselfly *Coenagrion pulchellum*. Many of these species are currently restricted in their distribution on the site to suitable wet habitats. The Mosses support locally important colonies of small pearl-bordered fritillary *Boloria selene* and are the southern-most locality in England for the large heath butterfly *Coenonympha tullia*. Other species of note include the raft spider *Dolomedes fimbriatus*, the bog bush cricket *Metrioptera brachyptera* and the nationally rare caddisfly *Hagenella clathrata* known at only two other sites in Britain.

The site is locally important for a variety of breeding birds including sparrowhawk *Accipiter nisus*, curlew *Numenius arquata*, snipe *Gallinago gallinago* and nightjar *Caprimulgus europaeus*. Over-wintering species include short-eared owl *Asio flammeus*.

The moss complex is also a local stronghold for the adder *Vipera berus*.