

County: Cumbria

Site Name: Duddon Mosses

District: South Lakeland and Copeland

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

Local Planning Authority: Copeland, South Lakeland District Council
Lake District Special Planning Board

National Grid Reference: SD 235887
SD 228882
SD 241875
SD 230870
SD 225860
SD 220850
SD 190849

Ordnance Survey Sheet 1:50,000: 96 **1:10,000:** SD 18 NE, SE, SD 28 NW, SW

Date Notified (Under 1981 Act): 1987 **Date of Last Revision:** –

Other Information:

1. This is a new site.
2. The site is considered to be equivalent in status to those sites listed in 'A Nature Conservation Review', edited by D. A. Ratcliffe, 1977, published by Cambridge University Press.
3. Black, White, Heathwaite and Latter Rigg Mosses lie within the Lake District National Park.

Description and Reasons for Notification:

The Duddon Mosses are an extensive system of raised mires situated at the head of the Duddon Estuary. The site consists of eight discrete areas of mossland: Latter Rigg Moss, Black Moss, Heathwaite Moss, White Moss, Wreaks Moss, Little White/Bank End/Angerton Mosses, Herd House Moss and Arnaby/Shaw Mosses. Two of these, Arnaby and Shaw Mosses lie 3 km south-west of Broughton-in-Furness, on the western side of the Duddon estuary, whilst the remaining mosses lie between 1 and 4 km east of Broughton-in-Furness on the eastern side of the estuary. Together the complex of mosses form, after the mosses on the south Solway Plain, the most important group of lowland raised mires in Great Britain in terms of their size and the diversity of habitats represented. Within South Cumbria they are rivalled in size only by the mosses at Roudsea which are much smaller and show a smaller range of habitats. The range of habitats of the Duddon Mosses is similar to those of the Solway Mosses but their geographical position is more varied, extending from the coast, to the head of the Kirkby Pool valley where the mosses are surrounded by upland fell-land. This latter peatland system is thought at one time to have been continuous, along the entire length of the Kirkby Pool valley but is now represented by the discrete, though contiguous units of the Duddon Mosses. Such estuarine raised mire systems were also formerly extensive around Morecambe Bay but have been reduced in extent both nationally and in Cumbria due to peat extraction, agricultural reclamation and afforestation.

The site supports areas with typical bog communities as well as areas of wet heath, scrub, broad-leaved and mixed woodland, and acid grasslands. Peat cutting in the past has affected all

of the mosses to varying extents. Some mosses, such as Wreaks and White Moss have suffered only marginal peat cutting, leaving the original peat dome intact, whilst others, such as Bank End Moss have a mosaic of peat-cut hollows and original surface, and some have been almost entirely cut over, such as Arnaby and Shaw Mosses, leaving only isolated remnants of the original bog surface. However, since most of these cuttings occurred prior to 1945 there has been time for recolonisation of these areas with typical peatland vegetation. These areas therefore retain considerable interest and provide good potential for the restoration to an actively growing raised mire. Peat cutting, associated with drainage of parts of the mosses and continued marginal agricultural drainage is thought to have led to a drying out of most of the mosses with subsequent scrub encroachment. Periodic fires on the mosses such as Bank End Moss appear to have kept some of the scrub invasion at bay, but at the expense of reducing the interest of the communities present.

The largest uncut and intact areas of original peat dome remain on Wreaks and White Moss with more fragmented, but still quite extensive remains on Heathwaite, Little White and Bank End Moss. These areas support a modified bog vegetation approaching wet heath with heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, and hare's-tail cottongrass *Eriophorum vaginatum* forming tussocks over much of the area. Bog mosses vary in their extent in the hollows between the tussocks, consisting of only *Sphagnum rubellum* where conditions are drier to a wider assemblage where conditions are wetter, with species such as *S. magellanicum* and *S. cuspidatum*. White beak-sedge *Rhynchospora alba* is abundant where *Sphagnum* cover is low and there is much bare peat. Both Wreaks and White Moss have an abundance of *Cladonia* lichens which include *C. impexa*, *C. floerkeana*, *C. pyxidata* and *C. coniocraea*, indicating an absence of fire for many years. On the edges of the uncut peat areas and on isolated peat hags dry heathland vegetation occurs and consists of heather, cross-leaved heath and deer grass *Trichophorum cespitosum*.

The wettest and most actively growing areas of the mosses occur in the peat-cut hollows where the water table is much higher. These areas support more of the characteristic raised mire plants which would originally have been found on the uncut peat areas, and include cranberry, bilberry, round-leaved sundew, bog asphodel, bog rosemary *Andromeda polifolia* and hare's-tail cottongrasses. Mosses form a major part of the community and include carpets of *Sphagnum recurvum*, *S. cuspidatum*, *S. tenellum*, *S. magellanicum*, *S. papillosum*, *Polytrichum commune* and *Pleurozium schreberi*.

At the peripheries of all of the mosses and on some of the peat-cut hags where the flow of water is not impeded, acid marshy grassland has formed. This generally comprises dense species-poor and tussocky purple moor-grass grassland with bog-myrtle *Myrica gale* and species such as marsh marigold *Caltha palustris*, marsh pennywort *Hydrocotyle vulgaris*, tormentil *Potentilla erecta*, heath spotted-orchid *Dactylorhiza maculata* sub sp. *ericetorum*, the bog moss *Sphagnum palustre* and *Polytrichum commune* growing in the hollows between the tussocks. Flushed areas have swards of carnation sedge *Carex panicea*, star sedge *C. echinata* and common yellow-sedge *C. demissa*. Black Moss and Latter Rigg Moss have good examples of these types of grassland. Some areas of moss such as at Arnaby Moss support a different type of marshy grassland which is characterised by soft rush *Juncus effusus* with Yorkshire fog *Holcus lanatus*, common bent *Agrostis capillaris*, creeping buttercup *Ranunculus repens* and field woodrush *Luzula campestris*. These types of grassland are representative of the edge or "lagg" community which under natural conditions would occupy the boundary between raised bog and the wet flushed ground at the foot of the surrounding slopes of adjacent valley-sides. However, due to agricultural reclamation of the moss surface along many of the valley-sides, these communities have been lost from their natural locations and are now present only in a more central position within the valley. Although these communities still occur along the

peripheries of the mosses they now occur on areas which originally would have supported bog vegetation. In their original state the peripheral acid marshy grassland communities would probably have been too wet to support continuous woodland except occasional areas of wet woodland (carr). However, because of modification to the drainage of the moss surface and to surrounding land much of the peripheral acid marshy grassland is now quite dry for much of the year, and has consequently been invaded by birch, Scot's pine and Rhododendron scrub. The ground flora in these areas is species-poor and is dominated by tussocky purple moor-grass with bilberry, bracken and hummocks of the mosses *Sphagnum palustre* and *Polytrichum commune*. On some of the mosses, such as Wreaks and White mosses the scrub encroachment has been particularly extensive and has started to invade the central bog surface.

Good examples of wet woodland (carr) occur at Black, Bank End, Angerton and Shaw mosses. The woodland at Black Moss lies in a hollow below Middlescough. Here, species-poor grassland dominated by sheep's fescue and common bent gives way to alder, birch and willow *Salix cinerea* carr. Species such as meadowsweet, water avens, marsh marigold, marsh valerian, cuckoo flower, remote sedge *Carex remota*, bottle sedge *C. rostrata*, reed-grass and Lesser spearwort occur throughout the woodland whilst in parts the bog mosses *Sphagnum palustre*, *S. recurvum*, *S. squarrosum* and *S. fimbriatum* form dense hummocks. Drier birch woodland to the north has a number of large clumps of the Royal fern *Osmunda regalis*. This relatively uncommon fern has good populations on all of the mosses.

The Duddon mosses display a rich fauna. Roe deer are particularly frequent and the breeding bird community includes species such as nightjar, woodcock, heron, curlew, cuckoo, tawny and barn owls and buzzard. Reptiles found include the adder, common lizard, common frog and common toad. The insect life of the mosses is rich. For example, on Little White Moss over 170 species of butterfly and moth have been recorded. These include 15 notable species whose distribution are restricted on a national scale and include species such as the rare large heath butterfly *Coenonympha tullia*, the small elephant hawk *Deilephila porcellus*, the silver hook *Eustrotia uncula*, the coast dart *Euxoa cursoria*, the marsh oblique-barred *Hypenodes turfosalis* and the golden-rod brindle *Lithomoia solidaginis*. *Anoplus roboris*, *Cryptocephalus parvulus* and *Notaris bimaculatus* are three notable species of beetle which have been recorded from Arnaby and Shaw mosses.

The layers of peat laid down over the centuries provide an irreplaceable historical record of vegetational and sea-level changes in the area and are thus valuable for paleo-ecological research.