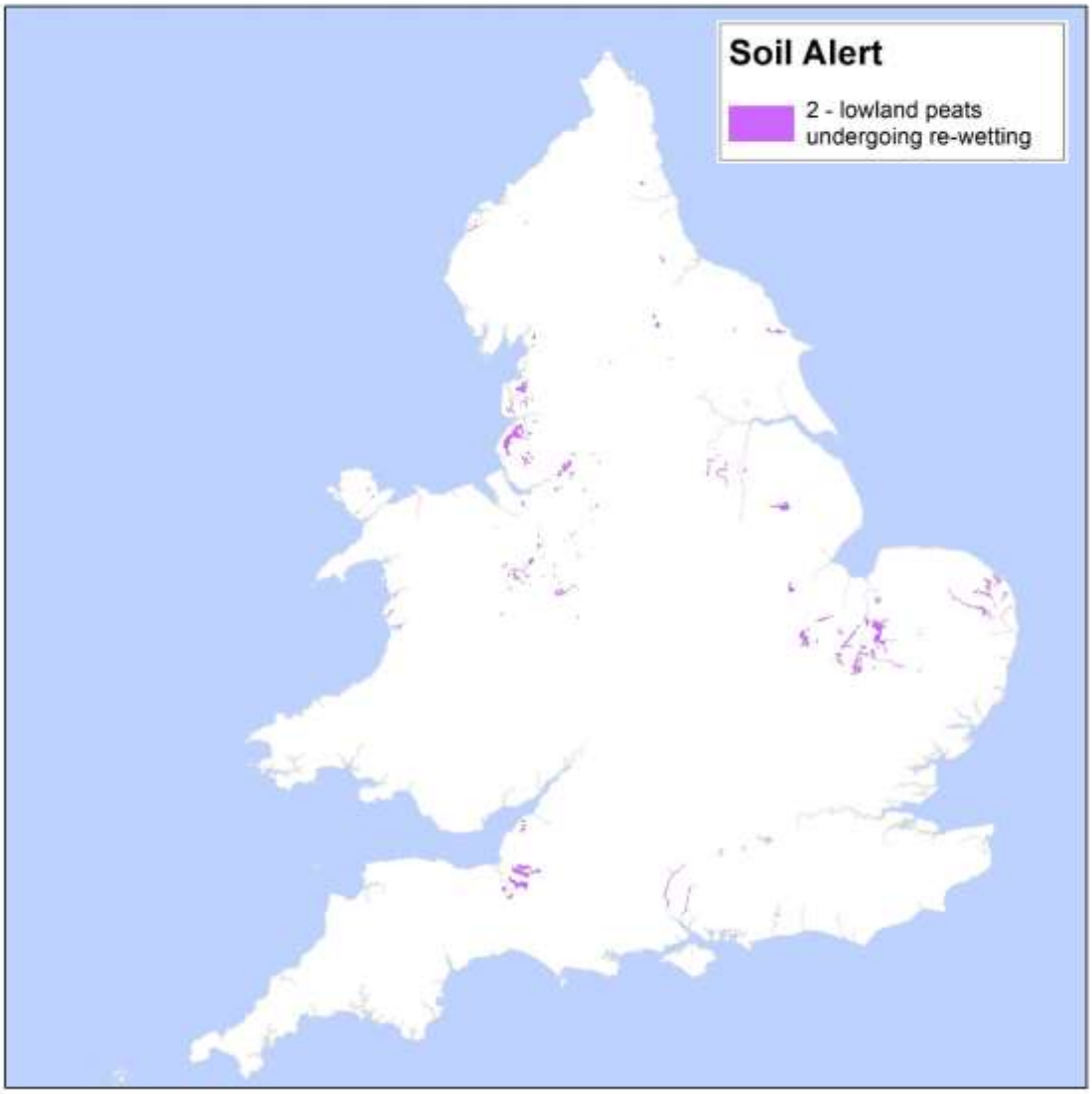
Rewetting of Lowland Peats

With artificial drainage, soils developed in lowland peat deposits are of prime value for agriculture, including field vegetables. However, the fragile nature of peat results in rapid loss (wastage) as a result of drainage and other factors involved in agricultural improvement and management, together with a long history of cutting for fuel and use in the horticultural industry. Given increasing recognition of the importance of peat in preserving wetland habitats, and providing waterlogged environments for the preservation of organic archaeological remains, re-wetting of peat has become an important objective of its future management.



On the National Soil Map of England and Wales, lowland peat soils are in the following soil associations:

1021 Turbary Moor
1022a Altcar 1
1022b Altcar 2
1024a Adventurers' 1
1024b Adventurers' 2
1024c Adventurers' 3

Soil Alert 2
lowland peats undergoing re-wetting

In most cases the main soil series are developed in fen peat, the exception being Turbary Moor soils which are formed in more acid raised bog. Peat soils vary from those remaining wetter and largely unimpacted by drainage, to those in which drying out (ripening) has led to the development of earthy topsoils with blocky structure.

Though peat is formed from dead plant material preserved originally under anoxic waterlogged conditions, most lowland peat has been the subject of surface disturbance, the exception being in a small number of bogs and fens protected for habitat and nature conservation. In the case of predominantly raised bog this has involved the digging of peat either for use as fuel, often over many hundreds of years, or in the horticultural industry. When worked out, some more extensive former commercially-worked areas have been handed over to nature conservation bodies, for management as wetlands, with a substantial proportion often reflooded for open water and reedbed habitats (photo 1). Elsewhere the land has been subsequently restored to agricultural use (photo 2) or left to develop as woodland (photo 3), though in most of these cases, peat wastage has continued under predominantly aerobic condition with consequent lowering of the ground surface and exposure of previously buried organic material (photo 4). On drained fen peats, prized for agricultural and horticultural cropping, peat wastage continues to take place.

In Cambridgeshire, the Great Fen project, connecting the nature reserves of Holme Fen and Woodwalton Fen, is restoring wild fen on peat that is currently under intensive agriculture. This ambitious 50-100 year habitat restoration project will see 14 square miles restored to wild fen, creating a huge nature recovery network. The project will also experiment with paludiculture (farming with a high watertable) on areas of seasonally wet grassland. These Cambridgeshire peats are among those in lowland England that can become extremely acid when subsoils are exposed to the air, such as when scrapes and ponds are excavated and which, in turn, leads to the staining of water with iron ochre (see Soil Alert 1: Acid Sulphate Peats and Alluvium).

Photo 1: Nature reserve of flooded former peat workings

Soil Alert 2
lowland peats undergoing re-wetting

Remnants or the site of former raised bog peat can be rewetted, though it may require considerable time and careful management to encourage regrowth of the bog surface (photo 5). The target area should be effectively bunded to preclude entry of surface water flows likely to be mineral-rich, and to ensure the growing bog is solely rain-fed. Where the intention is to rewet predominantly pastoral areas of peatland, some other issues should be borne in mind.

Where upper peat horizons have become dried out due to lowering of the water table by artificial drainage, the peat can become extremely hard and blocky, while dry and dense subsoil (drummy) layers can also occur. Such desiccated peat material is frequently unable absorb water, though groundwater can move up through the soil profile. Depending on management objectives, most often for nature conservation or regenerative farming, it is important to ensure that a survey has been undertaken to ascertain the thickness, character and extent of peat, to minimise risk of further wastage. Also, measurement of water regime by means such as dipwells will determine the seasonal fluctuation of the water table, especially during summer months when maximum risk of drawdown occurs.

With drying out and wastage of peat comes the increasing risk of loss of archive material including the pollen record and preserved organic archaeological remains such as the many prehistoric timber trackways found in Somerset. Such artefacts provide Important evidence from prehistory, which, once decomposed, become lost for ever. Academic research studies investigate whether current water level management is adequate to protect known organic archaeological remains (photo 6).

Where fields are surrounded by wide ditches (termed rhines in Somerset) (photo 5), water levels are penned higher in summer to act as wet fences, and lower in winter to provide flood water storage capacity (photo 6). Where the intention is to create or retain wet grassland habitats, it should be borne in mind that soil water levels in fields relate to those in adjacent rhines for only a matter of tens of metres distance, with the seasonal change in rainfall-transpiration balance causing the water table profile within fields to fluctuate from saucer- to dome-shaped.

Photo 2: Small-scale mixed farming on land restored following the removal of raised bog peat

Photo 3: Cut-over area of dried-out former raised bog now under woodland with bracken and further disrupted by animal burrows

Photo 4: Timber exposed by peat wastage

Soil Alert 2
lowland peats undergoing re-wetting

Photo 5: Creation of raised bog community on Westhay Moor (Somerset Wildlife Trust)

Photo 6: A research team from Reading University investigates conditions of the burial environment for organic archaeological remains

See also the Soil Alerts:

Restoring Functioning Riparian Wetlands
Potentially Acid Sulphate Peat and Alluvium
Soils Affected by Groundwater

Soil series affected by this alert:

10.21 Turbary Moor 10.22 Altcar 10.24 Adventurers'

References

Burton, R.G.O and Hodgson, J.M. (Eds. 1987). *Lowland Peat in England and Wales*. Soil Survey Special Survey. No 15, Harpenden.

Brunning, R. (2013). Somerset's Peatland Archaeology; managing and investigating a fragile resource. Oxbow Books, Oxford.

Cope and Colborne (1981). *Thickness of peat in the Somerset Moors. Map at scale 1:50,000.* Soil Survey of England and Wales, Harpenden.

Peat types, status, land use and management in a series of IUCN papers (UK Committee Peatland Programme Briefing Notes 1-10)

A useful reference for peat soils is Burton, R.G.O and Hodgson, J.M. (1980). *Lowland Peat in England and Wales*. Harpenden. This can be purchased from LandIS.