

Peatland Biodiversity

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Draft Scientific Review
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Summary

Land covered in accumulated peat is known as peatland. It is active peatland if peat is being formed now or it supports vegetation capable of forming peat. Estimates of the extent of peatland in the UK vary widely but most are between 1.5 and 2.5 million ha. The UK may host between 8.8 and 14.8% of Europe's peatland area and about 13% of the world resource of one peatland type, namely blanket bog. Indeed blanket bog forms the largest expanse of semi-natural habitat in the UK.

Biodiversity Features

Peatland biodiversity includes a range of rare, threatened or declining habitats, plants and animals. The bird assemblage is highly valued in a European context, and some plant assemblages are better represented in the UK than anywhere else in the world. However, peatland biodiversity is sensitive to changes in land management and to a range of other external drivers.

Active bog is characterised by an abundance of bryophytes, especially the bog moss, *Sphagnum*. Different *Sphagnum* species, with different preferences for degree of ground wetness, form the characteristic hummock and pool systems and thus create topographical variation. The plant assemblage also includes a range of sedges and dwarf-shrubs and grades into associated habitats such as wet and dry heathland. The peatland vegetation assemblage, alongside high water levels, provides the key ecosystem service of laying down new peat accumulations and maintaining the peat store.

UK peatlands have a rich and unique breeding bird assemblage. It is a species-poor assemblage though contains an exceptionally high proportion of species with legal protection under UK and European conservation law. The Flow Country blanket bog of Caithness and Sutherland is an extraordinarily rich area for birds. The red grouse is an iconic bird of peatlands and related habitats. Many upland areas are managed primarily to maximise its numbers for commercial shooting. However conflicts over predator control on grouse estates can be a barrier to biodiversity conservation initiatives.

Invertebrate assemblages on peatlands can be very species rich, especially for families that respond to small scale structural variation in vegetation and topography. Invertebrates on blanket bog play a key role in fragmenting plant litter as part of the peat accumulation process. Below-ground biodiversity is much less studied and the role that it plays in influencing vegetation change is little understood.

Challenges

There have been significant challenges to peatlands over the last 300 years in particular. A number of drivers cause peatland degradation. Peatlands close to industrial centres have previously suffered from SO₂ and N-deposition, both of which adversely impact on *Sphagnum* in particular. Drain construction was carried out extensively through much of the 20th century and though it has now largely ceased, its legacies of peat shrinkage and erosion remain.

Over-grazing and burning are currently the most significant ongoing activities that pose threats to blanket bog. Peatlands have a low carrying capacity for livestock and high grazing levels can suppress typical peatland vegetation. Burning impacts are poorly understood but may include adverse impacts on *Sphagnum*. In lowland raised bogs, hydrological change is the most significant threat with drainage of the bog or adjacent land lowering the water table and causing loss of vegetation and other biodiversity that depends on waterlogged conditions.

Climate change may exacerbate some of the negative drivers. Wildfire will become a greater threat in a drier landscape and increased storminess may cause greater erosion. Additionally there is already evidence of mismatches occurring in the timing of seasonal activity between predator and prey populations.

Impacts

Only 18% of blanket mire is currently in a natural or near-natural condition. Of the remainder, 16% is eroded, 16% is afforested and 40% is modified. The impacts are not uniform. Blanket bog in Scotland is in better condition than further south. Lowland raised bog also tends to be in a better condition further north though the picture is more mixed. Available evidence suggests that habitats on SSSI-designated peatland sites are in better condition than on non-designated sites. Peatland species show mixed trends but a majority of those designated as part of the UK Biodiversity Action Plan have declining populations.

Peatland management

Effective peatland management for biodiversity requires a good understanding of existing environmental and hydrological conditions. Under ideal circumstances hydrology and grazing livestock can be controlled. However this is often difficult. Burning is generally discouraged. Peatland restoration is a realistic option in most situations and the best results for returning peatland biodiversity will occur where the hydrology can be controlled over a wide area in order to achieve well functioning bogs. However restoration may not always achieve a natural peatland and benefits may only be seen only in the long-term

Co-ordination and dissemination of management information is important for maximizing the biodiversity potential of peatland management. Management for other benefits (e.g. carbon sequestration) if undertaken correctly could promote typical peatland species and bring assemblage-level benefits at least in the long-term. The conservation of some species, though, may require further actions within and beyond peatland sites.

Peatland management requires long-term commitment and can be costly to the practitioner. However society must recognise that it is good value compared to the overall costs of continued peat loss. Stakeholders should input to development of funding schemes to ensure that they can be implemented to the maximum benefit of peatland habitats.

Key Points

1. Blanket bog forms the largest area of semi-natural habitat in the UK. It often occurs in a matrix with related habitats.
2. Peatland biodiversity is characterised by specialized species adapted to thriving in a waterlogged, acidic, nutrient-poor environment.
3. The value of peatland habitats is recognised through UK and European legal obligations for their protection and restoration.
4. The peatland bird assemblages is recognised as internationally important. Many species breeding on peatlands have UK or European conservation designations and legal protection.
5. Peatlands have been subject to significant multiple negative drivers including burning, pollution, over-grazing and draining.
6. Only 18% of UK's blanket mire is now in a natural or near-natural state. The remainder is eroded, modified or has undergone land-use change (e.g. to forestry or peat extraction).
7. Biodiversity has been lost through peatland degradation. Evidence suggests that populations of many key species are in decline.
8. Restoration management has the potential to restore peatland function and biodiversity on some sites though reversion to a natural state with the full compliment of peatland species can be an unrealistic aim, in the most degraded situations.
9. Restoration needs realistic aims and a long term approach. It should be accompanied by well planned and resourced monitoring.
10. Peatland management needs to take a flexible adaptive approach to address different drivers. Management advice should be disseminated widely.