Moorland, Upland & Heathland

Headlines

- Several key priority moorland habitats are present, including lowland and upland heathlands, blanket bogs and upland flushes, fens and swamps, with the majority lying within designated sites. 12% of the Sheffield district is covered by heathland with an additional 12% of blanket bog.
- Most of Sheffield's moorland habitats lie within the Peak District National Park. However, some important heathland lies outside of the National Park. These lowland heathlands are mostly contained within Local Wildlife Sites (LWSs).
- Over 95% of moorland habitats are covered by designated sites, mostly with the highest level of European protection.
- 99% of Sheffield's moorland within Sites of Special Scientific Interest (SSSIs) is in either 'favourable' or 'unfavourable recovering' condition, compared to a UK figure of 94%.
- Lowland heathlands require regular ongoing management to maintain the habitat.
- Characteristic moorland species include red grouse, sphagnum mosses, ling heather and bilberry bumblebee. Key species such as cuckoo, ring ouzel, nightjar, peregrine falcon and mountain hare may be at risk from disturbance and, in some cases, persecution.
- The UK Biodiversity Indicator 'C5e: wintering waterbirds' highlights further species in trouble including dunlin, redshank and lapwing, with declines attributed to land management practices and habitat loss.

Derwent moors at sunset

Introduction

Sheffield's uplands are largely composed of moorland habitats and lie predominantly to the west within the upland areas of the Peak District National Park (PDNP). However, the Sheffield district also features a number of scattered lowland heathland areas (sometimes referred to as the Coalfield Heathlands), which are more centrally distributed. In addition there are a number of intermediate sites where heathland forms a mosaic with woodland. These include the steep, wooded river valleys – such as Porter Clough and the Limb Valley – draining the higher moors. The management of these mosaic heathland areas including woodland is normally covered by relevant woodland management plans (see woodland chapter).

The vast majority of Sheffield's moors are open access and are of significant value to the people of Sheffield in regard to access to nature, recreation, health and well-being and cultural heritage. Moorlands and heathlands also have a significant part to play in climate change mitigation, flood control and water quality management.

What moorland habitat types does Sheffield have?

Figure 1 shows the composition of Sheffield's moorland, upland and heathland habitats. How these broad habitat types are distributed across the district is also mapped (Figure 2). In this report, moorland habitat – mostly upland heath – has been divided into four distinct types related to coverage of ling and bell heather (*Calluna vulgaris* and *Erica cinerea*, respectively) and bog. These habitats are further defined in the Appendix. Heather-dominated habitats make up nearly 50% of Sheffield's moorland with the other half being bogs that are either heath-dominated or grass-dominated (33% and 14%, respectively). Within the upland region of the PDNP there is also a quantity of unimproved acid grassland, constituting the moorland fringe, which is also considered in this chapter as an upland habitat. Sheffield's moorlands are covered by the Sheffield Heathland Habitat Action Plan (HAP)[1] and the Peak District's Biodiversity Action Plan[2]. The recent 'State of Nature in the Peak District' report also goes into further detail regarding the habitats and wildlife of Sheffield's moorlands, and is a valuable resource for their ongoing protection.

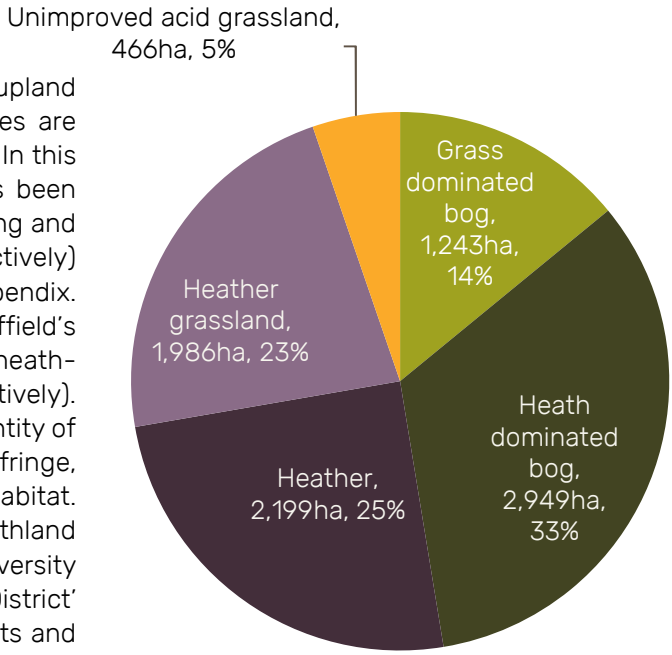


Figure 1 (above): area (hectares) and percentage coverage of moorland habitat types within the Sheffield district.

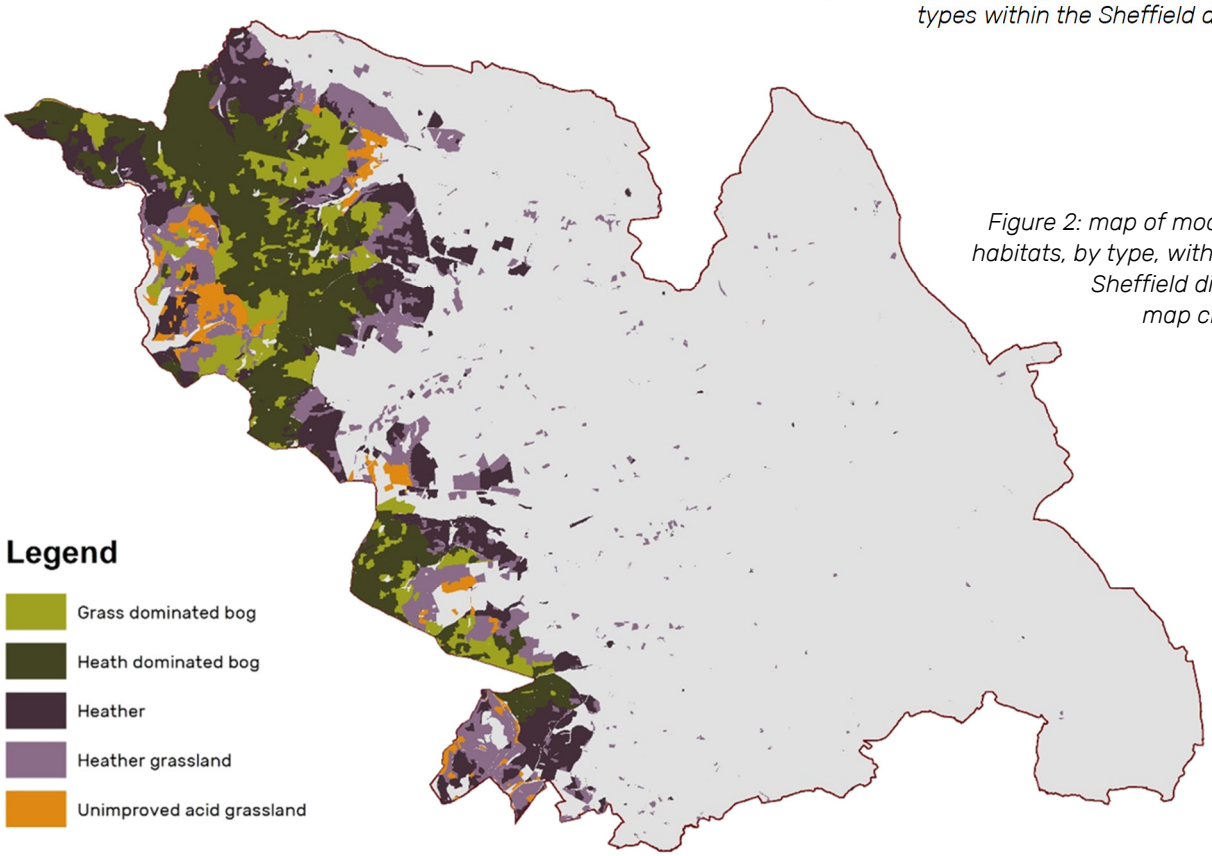


Figure 2: map of moorland habitats, by type, within the Sheffield district; map credit 1

Priority Habitat Inventory: Moorland, upland and heathland habitats

Many of the constituent habitats of moorlands - upland heathlands, blanket bogs and upland flushes, fens and swamps – plus lowland heathlands, are mapped on Natural England's (NE) Priority Habitat Inventory (PHI) as designated UK Priority Habitats. They are recognised for their scarcity and importance for the natural environment, susceptibility to habitat modification and for their support of associated priority species[3]. These habitats support a range of more unusual higher plants typical of the Peak District, including species such as cloudberry, chickweed wintergreen and bearberry (at the southern edge of their range on Hallam, Houndkirk and Derwent Moors respectively); bog rosemary, common cow-wheat and bog pimpernel.

The majority of the areas of priority habitat fall within two Sites of Special Scientific Interest (SSSIs) – the Dark Peak and the Eastern Peak District Moors - which are incorporated into the South Pennine Moors Special Areas of Conservation (SAC) and Special Protection Areas (SPA), both European designations. Only a few sites fall outside the designated area, including Whitwell Moor, areas on Agden Side, White Lee Moor, Swan Height and Kirk Edge. These sites, together with the Ughill and Rod moors (within the EPDM SSSI), are distinctive outliers to the main moorland block to the west. They are of particular importance to the local Sheffield landscape, increasing the area of transitional habitats which are often of particular wildlife value. Agden bog, a SRWT nature reserve (see case study), is one of a small group of undesignated upland wetlands in the Bradfield area.

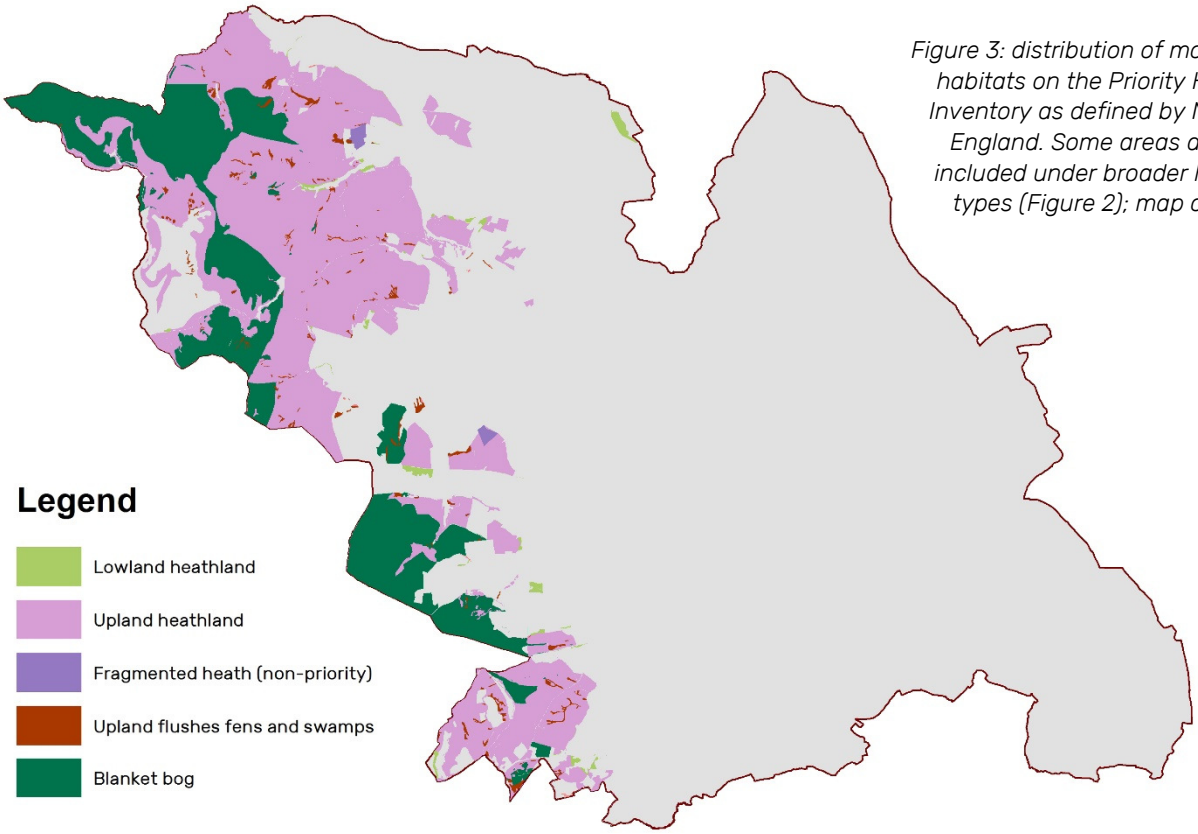


Figure 3: distribution of moorland habitats on the Priority Habitat Inventory as defined by Natural England. Some areas are also included under broader habitat types (Figure 2); map credit 2

Upland heathland is found on the lower moors and slopes below the plateau and is dominated by ling heather. A variable proportion of other dwarf shrubs, commonly bilberry and crowberry, may be found beneath the heather with cowberry locally abundant north of the A57 in a nationally unusual species assemblage. A combination of burning and over-grazing particularly around the moorland fringes has resulted in some areas losing diversity and being dominated by acid grasses; commonly matt grass and wavy hair grass with purple moor grass on the wetter slopes. In these areas bracken can be locally abundant.

Blanket bog is found on the high plateau where it contains variable quantities of cotton-grasses and dwarf shrubs over deep peat. The peat-forming bog-mosses (sphagnum) are limited in extent largely as a result of historic atmospheric pollution. However, the Hallam and Ringinglow Bogs are recognised as one of the few Peak District locations where sphagnum still survives in large quantities and the peat is actively growing. Elsewhere the blanket peats exhibit erosional features caused by complex issues including pollution, fires and climate change.

Upland flushes, fens and swamps are the most botanically rich communities in the area dominated by rushes or common cotton grass with a wide range of associates including star sedge, sphagnum, bog asphodel and marsh pennywort. Bog pondweed and round-leaved crowfoot can be found along seepage lines.

Round leaved sundew
© Nabil Abbas

Key heathland sites within the Sheffield Local Planning Authority Boundary

As described on the previous page, most of Sheffield's moorlands fall within the Dark Peak area of the Peak District National Park. The majority of the small pockets that are outside this area are lowland heathland, with the exception of Whitwell Moor which is wetter and more upland in character (Figure 4). This resource is very small and fragmented and represents a formerly more widespread habitat type which has been largely lost historically to agricultural intensification and coal mining.

Figure 4: moorland habitat lying outside of the PDNP (PDNP defined as white) and moorland covered by LWS status; map credit 1

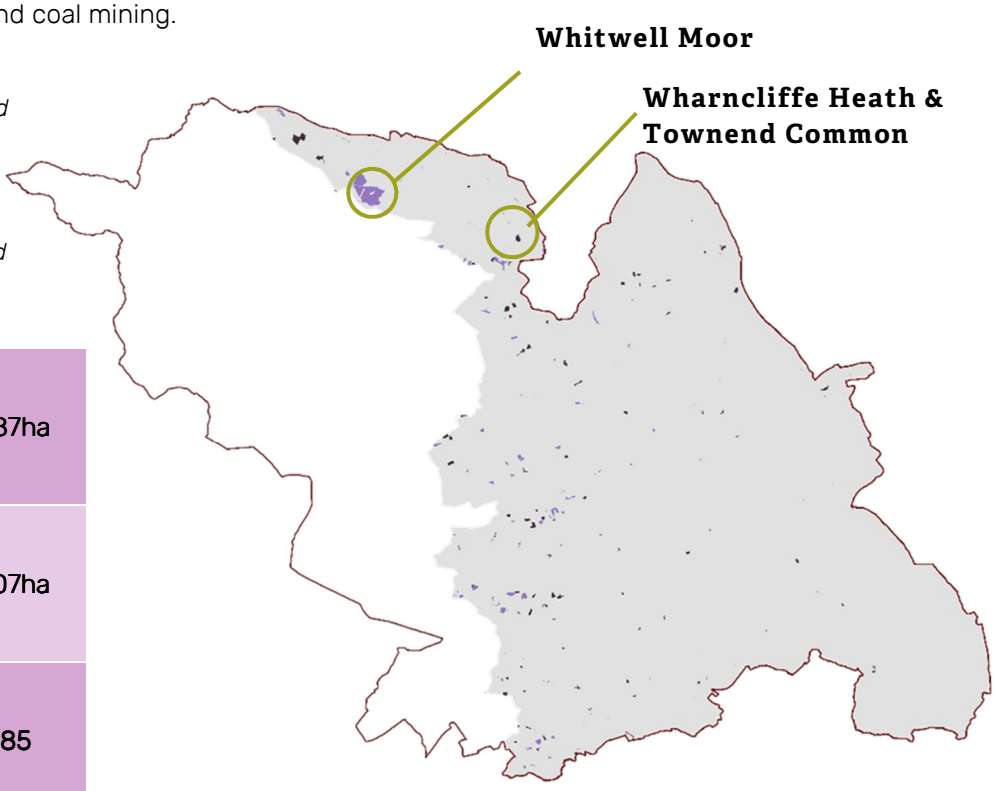


Table 1 (below): details of moorland and heathland habitat and LWSs outside of the PDNP

Area of moorland & heathland outside of PDNP	187ha
Area of LWSs containing moorland or heathland	107ha
Number of LWSs containing moorland or heathland	85

Sheffield's Heathland HAP highlights 25 of the most important lowland heathland sites[1]. The majority are small; only two are over 10 hectares (Wharncliffe Heath and Townend Common, Figure 4) and a further four support between five and 10 hectares of heath including Loxley and Wadsley Common. Wharncliffe Heath is shown as a priority Lowland Heathland habitat by Natural England (NE). This site includes approximately 170 hectares of heathland habitat, most of it lowland in character or intermediate to a more upland type. These sites all lie within the Yorkshire South Pennine Fringe Natural Character Area in elevated locations, and, as with the Peak District moorlands, are associated with gritstone outcrops and escarpments. The majority are contained to some extent within Local Wildlife Sites (LWS; Table 1). Eight of the larger sites are on, or form part of, Local Nature Reserves (LNRs). Eleven local groups are actively involved in the management of 16 out of the 25 most important sites, and 13 management plans are in place[1]. Few of these areas are grazed and all are open to public access.

These lowland heathland habitats are commonly dominated by ling heather and are often found in a mosaic with areas of scrub, grassland and wetlands; it is this variability and diversity that imparts much of the wildlife value. Important species widely distributed amongst these LWSs include: grass snake and common/viviparous lizard; a range of birds typical of the moorland and woodland fringe including whinchat, nightjar, tree pipit, spotted flycatcher, redpoll and cuckoo; green hairstreak butterflies; and brown hare.

Case study - Coalfield Heathlands Project 2005 – 2010
Roy Mosley, Former Coalfield Heathlands Project Manager
Sheffield & Rotherham Wildlife Trust

This partnership project, located across 25 sites in South and West Yorkshire, was set up to address the issues surrounding the conservation of Coalfield (lowland) heathlands including their management and fragmentation and to encourage greater understanding, enjoyment and involvement of the area by local people. A total of £1-million was invested in the project with lasting impacts for heathland condition, extent, associated species and local communities. The project included four sites in Sheffield: Back Edge; Parkwood Springs; Townend Common; and Wharncliffe Heath. Habitat, access and interpretation management plans were implemented for all sites.

Over the whole larger project area, 300ha of heathland on 25 sites were restored or created. Over 2,000 people were involved in heathland events across 4,000+ volunteer days, including educational sessions, which were delivered to 53 groups of school children. Additionally more than 50 NVQ or other local accreditations were achieved through the project's training, securing further investment and involvement in the conservation of this unique area[4].

Townend Common © Steel Valley Project

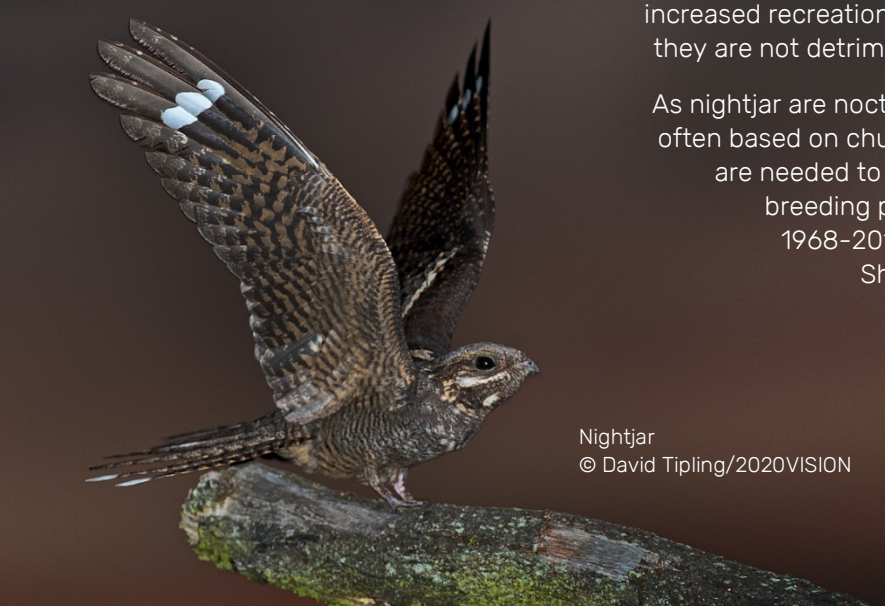
Case study: Nightjar[5-9]
Michael Senkans, Biodiversity Monitoring Officer, Sheffield City Council

Nightjar are an amber-listed species (Bird of Conservation Concern) associated with lowland heath and, more recently, felled or newly planted conifer plantations. Historically the species underwent a significant range contraction of 51% in Britain prior to 1981. Between 1981 and 2002, the number of 'churring' males has increased from 2,100 to 4,600. Despite this doubling in numbers, there has been little range expansion. This countrywide increase is likely to be due to both habitat protection and restoration since the 1980-90s.

Locally, prior to the early 1970s, the nightjar's breeding range was limited to areas below the gritstone edges. Since then it has followed recent national trends with a moderate population increase, despite declining between 1975–1980, with declines likely to be due to wetter, cooler springs. Though suitable nightjar habitat has remained stable locally since the 1970s, weather conditions may be crucial to the nightjar's success. A slight increase in the mean minimum and maximum temperature during May and June will influence the availability of insect prey, whilst excessive rain during the same period could push this species in the opposite direction. The implications of climate change are uncertain.

Local populations of this transient species may also be threatened from increased recreational pressure. Care should be taken to ensure that they are not detrimentally impacted from new recreational projects.

As nightjar are nocturnal, it is difficult to confirm breeding with data often based on churring or displaying males only. Fledgling surveys are needed to get a true picture of breeding success. The local breeding popualtion is thought to be 10-20 pairs. Between 1968-2017 there were 168 total records for nightjar in the Sheffield area, plus an additional 320 records from 2005-2015 from the Sheffield Bird Study Group. Popular sites are Wharncliffe, Ewden Valley, Strines Moor, Bradfield Moor plus recently and partly-felled plantations including Burbage, Redmires and Agden Side.



Nightjar
© David Tipling/2020VISION

Status of moorland habitat within protected areas

	Total moorland covered by site designation
Special Areas of Conservation	93%
Sites of Special Scientific Interest	95%
Local Nature Reserves	0.1%
Local Wildlife Sites	1.2%
All designated sites*	**96%**

Table 2 (left): percentage of moorland within the whole of the Sheffield district that is covered by designated sites

Herdwick sheep on Strawberry Lee Pastures, Blacka Moor nature reserve © Nabil Abbas

A large portion of moorland habitat (96%) is covered by designated and protected sites, most substantially as SSSIs across the eastern Peak District. Most of the habitat also has additional SAC and SPA status (Table 2). Over 99% of Sheffield's SSSI moorland is in either 'favourable' or 'unfavourable recovering' condition (Figure 5). In contrast, very few LWSs feature heathlands or bog and therefore these sites protect a very small proportion of the total habitat. This is partly because LWSs are not created in areas that have existing European status such as the PDNP. Of the LWSs that do feature grass or heather heath (Figure 4), nearly three-quarters (74%; 76ha) are not in positive conservation management. Indeed, heathland habitat requires on-going management. This can be a challenge for all landowners and remains a threat to moorland habitats outside of the PDNP. LNRs cover only a tiny fraction of moorland habitat.

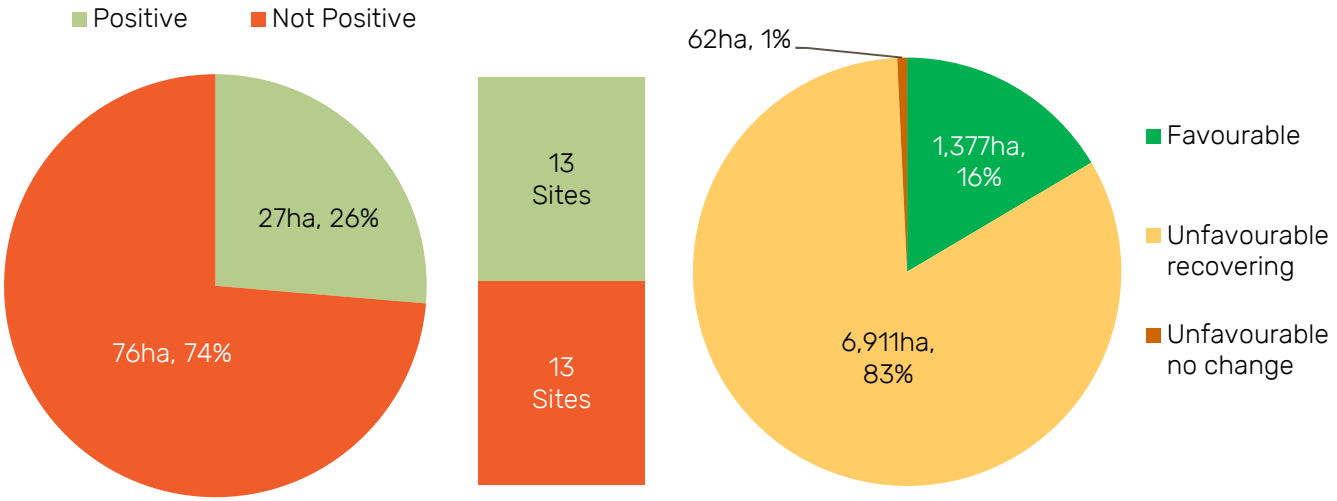


Figure 5: management status of moorland habitat within LWSs by proportion and area size (left) and condition of moorland sites within SSSI units (right). Only sites containing moorland patches larger than 0.5ha were considered to ensure that positive management included reference to the moorland habitat as a significant component.

Case study: Agden Bog
Rachel Stevenson, Community Wildlife Ranger, Sheffield & Rotherham Wildlife Trust

Agden Bog is a small but important wildlife site in north-west Sheffield. The site is owned by Yorkshire Water and has been managed since 2017 by Sheffield & Rotherham Wildlife Trust (SRWT). The site falls on the corner of Agden Reservoir with the bog land mainly formed from a series of converging seepages which emerge from a steep hill. Water from the bog then travels further downstream through the site in a series of runnels to form a mosaic habitat of tussocks and small hollows of open water, finally leaving the site as two small water trackways heading towards Adgen Dyke which runs into the reservoir. The site is a good example of bog land that has been mostly lost due to draining of land for agricultural purposes. The area is home to some important and locally rare plant species such as the insectiverous sundew, common spotted orchid, heath spotted orchid and bog asphodel. The majority of vegetation in the bog is low-growing with sedges, mosses and sphagnum cushions, as well as reeds and rushes that prefer acidic conditions. The reserve is good for reptiles and invertebrates including a recent sighting of a purple hairstreak butterfly. Nightjar, spotted flycatcher, siskin, lesser redpoll and common sandpiper have all been recorded nesting in nearby areas.

The site is currently being grazed by cattle in the summer months as part of the management regime started by Yorkshire Wildlife Trust (YWT) in 2012 and being continued by SRWT. This is helping to reduce scrub encroachment and promote conditions for the low growing vegetation on site, hopefully encouraging specialist species to return such as common butterwort. The site can be visited at any time of year; however, June is an excellent time to catch many of the wildflowers in bloom.

Case study: Flies (Diptera)[10,11]
Rhodri Thomas, Cranefly Recorder, Sorby Natural History Society

Craneflies are a key component of the Peak District's peatland fauna and are a major prey item for breeding birds, particularly the small dark grey cranefly *Tipula subnodicornis*. However, the eggs and young larvae are highly susceptible to drought and so are at significant risk from climate change.

Although several groups of flies such as hoverflies and craneflies have been studied reasonably well in Sheffield by members of the Sorby Invertebrate Group, there is little quantifiable information to enable detection of changes over time, or to identify whether any changes are the result of real change rather than the intensity of recording. However, anecdotal observations of 'vehicle windscreen casualties' over the last few decades suggest large declines in the number of aerial insects, and likely changes may be inferred from habitat change.

Nectar-feeding species, including many hoverflies, have probably declined substantially, along with other pollinators, with the widespread loss of flower-rich grasslands. Brownfield sites are likely to have provided important refugia, but require imaginative planning policies if those benefits are to be anything more than temporary. Species whose larvae are associated with dung are also likely to have been significantly reduced with the use of persistent vermicides to treat livestock. Wetland and aquatic species such as snail-killing flies and many craneflies have probably also suffered from habitat loss, but wetland creation and water quality improvements may have compensated for some of these losses.

Looking to the future, deadwood species, which include many uncommon specialists, are likely to be in for a good time as ash dieback spreads. Warmth-loving species such as some of the predatory robber-flies may benefit from climate change, and aquatic species will probably continue to benefit from improving water quality. Continuing extensive moorland restoration results in an increase in soil moisture and an associated significant increase in cranefly abundance. The future of the insect fauna and associated birdlife of the moors may therefore be much brighter than it might have otherwise been.

Helophilus
© Paul Richards

Characteristic moorland species

Ling heather © Kerry Long

Red grouse © Rob Miller

Chartley sphagnum © Vicky Nall

Ling heather
Ling heather is the dominant species of Sheffield's heathlands. This is not typical of upland heaths but is believed to be a result of local historic management and pollution. Proactive conservation management in recent years has sought to increase the extent of heather and other dwarf shrubs in upland acid grassland areas and to increase the age range of the heather plants.

Red grouse
This charismatic bird is endemic to the British Isles. It is a characteristic species of the moorlands of the Peak District. Many of the privately owned moorlands are managed for seasonal gamebird shooting. The territorial and monogamous behaviour of this species means all available habitat is filled with territories[12].

Sphagnum
These mosses are the major peat forming species of the blanket bogs. It is very susceptible to atmospheric pollution, erosion and fire damage and as a result many of the Peak District's blanket bogs are in a poor condition, although positive action and management agreements are seeking to reverse this trend. Only a few species are now widespread in comparison to several prior to the industrial revolution. The Moors for the Future (MFF) Community Science project is encouraging members of the public to become involved in recording sphagnum.

Bilberry bumblebees
© Tom Aspinall

Bilberry bumblebee
The bilberry bumblebee is a cold-loving species of uplands, moorlands and moorland edges and typically feeds on bilberry and willow, bird's-foot trefoil, clover and bramble. Queens emerge from hibernation in April and workers are present from May onwards. They tend to nest at the base of bilberry or heather plants. In the past the bilberry bumblebee was widely found in northern and western Britain but now appears to be in decline. As a cold-loving species it is likely to be vulnerable to climate change. In the UK it reaches the south-eastern edge of its distribution in the Peak District and is usually only found above 300m. The Peak District is, therefore, likely to be one of the first places that its decline will be observed.

Bilberry bumblebees have been recorded at Totley Moss, Blacka Moor and Longshaw. The Moors for the Future (MFF) Community Science project is encouraging members of the public to share their records for this species both with the aim of encouraging site-specific conservation measures and to facilitate climate change impact monitoring.

www.moorsforthefuture.org.uk/community-science

Peregrine falcon

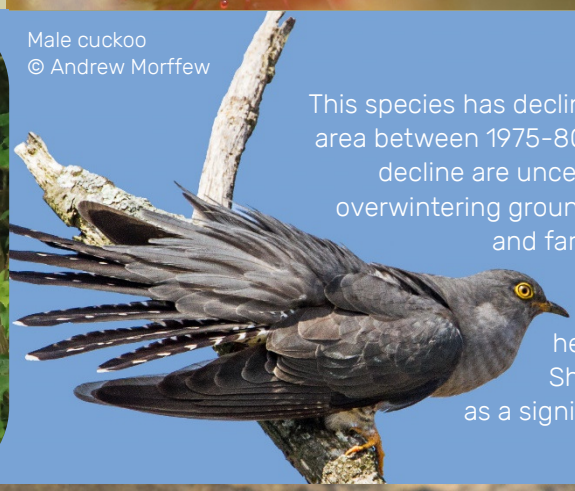
Within moorland areas peregrines have suffered declines during the 21st century. Between two and four breeding pairs were recorded annually in the Derwentdale area between 2000-2011, but no breeding pairs were recorded in 2017. This picture is mirrored across the whole of the Dark Peak within the PDNP and contrasts with an increase from 6–32 breeding pairs within the White Peak between 2000 and 2011 and an increase in urban Sheffield and Rotherham[7].

Round leaved sundew

An insectivorous plant confined to scattered locations in the uplands with the largest Pennine population found at Emlin dike on the Bradfield Moors.

Sundew © Nabil Abbas

Peregrine
© Jon Hawkins



Male cuckoo
© Andrew Morffew

Cuckoo

This species has declined by 50% in the wider Sheffield area between 1975-80 and 2003-08[6]. Reasons for this decline are uncertain but thought to be related to overwintering grounds. These are birds of the upland and farmland woodland fringe and have Blacka Moor as a stronghold, but are also present on the lowland heathlands of central and northern Sheffield. Here they are recognised as a significant species on many key sites.

Common lizard © Graham Thorpe

Lizards

The common or viviparous lizard (*Lacerta/Zootoca vivipara*) is the UK's most common and widespread reptile. Slow worm (*Anguis fragilis*) have been recorded in the neighbouring White Peak, although they have also been recorded in Nether Edge, the likely result of an introduction (pers comms J Newton, SNHS Amphibian and Reptile Secretary). The sand lizard (*Lacerta agilis*) is not found in the Sheffield area. The common lizard is a UK BAP priority species and listed in (NERC Act Section 41) Species of Principal Importance in England and is protected under the Wildlife and Countryside Act (1981).

The Sheffield Biolological Records Centre only holds 150 records for the common lizard, ranging in date from 1950-2017. In Sheffield, its main distribution is in the west and is commonly seen in the gritstone/heather-dominated moorland habitats. There are also a few central and eastern Sheffield records: Wickfield Heath (1986, 2006 and 2013), Beighton Railways Sidings (2006, 2010) and Wardsend Cemetery[13]. Lizards are under-recorded. They are most often seen fleetingly, a tail disappearing into the undergrowth, but occasionally they may be viewed when basking, especially earlier in the day. Dry stone walls, for example the one at Strawberry Lee Pastures at Blacka Moor, are worth checking.

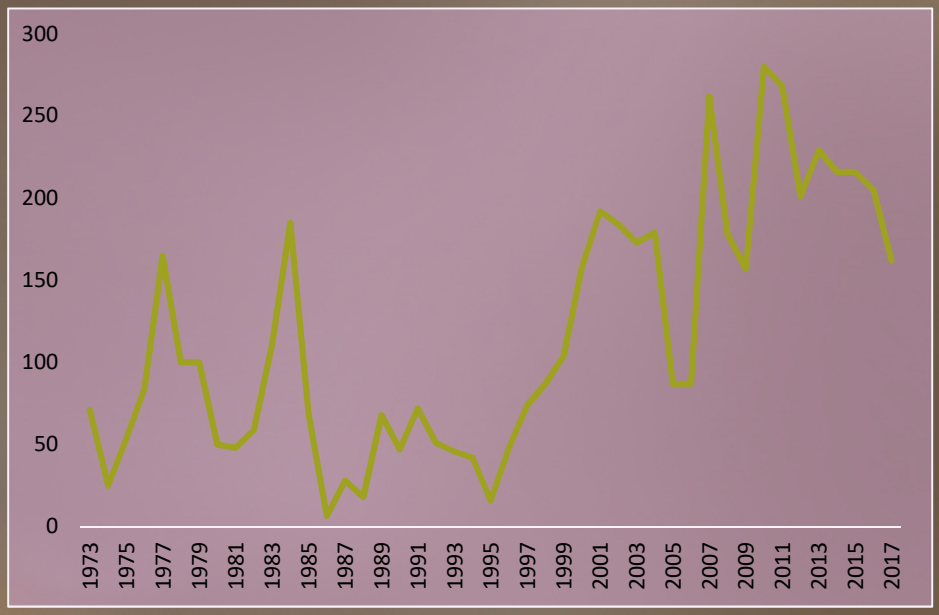
Case study: Over 40 years of the Colin Marsden mountain hare walk
Val Clinging, Mammal Recorder, Sorby Natural History Society

The Sorby Natural History Society (SNHS) has been monitoring the population of mountain hares (*Lepus timidus*) on the Sheffield side of the PDNP for many years via the annual 'mountain hare walk'. This annual event normally takes place each year in March. It was inaugurated by the late Colin Marsden in 1973 and has continued every year since, no matter what the weather (except for 2001 when the foot and mouth epidemic prevented access).

The walk route of between 15 to 18 miles encompasses both Sheffield and Derbyshire moorland from Cutthroat Bridge to Smallfield, Back Tor, Featherbed Moss and Margery Hill. Detailed reports from the walks have been published in the Sorby Record[14,15]. The hares in this area were introduced in the 19th century from Scotland and spread to become well-established as part of the fauna on the Peak District moors. The walks also generate records of other species such as golden plover, red grouse, ring ouzel, wheatear, curlew, hen harrier, lizards and the scarce ground beetle *Carabus nitens*. After 44 years the walk has now become an institution.

Over the years the starting location, number of participants and weather conditions have varied greatly and so have the number of hares seen. From an all-time low of five recorded in 1986, numbers have steadily risen to a record 280 in 2010, and since 1995, the population has appeared to be thriving (Figure 6). Weather conditions are also recorded and analysed throughout the year against which hare numbers can be compared. For example, it appears that good summer weather allows more leverets to survive, high rainfall through autumn allows vegetation to continue to grow and therefore the hares to feed well for longer, and less harsh winters help survival rates[16]. Although they can cope with the cold weather, prolonged periods of snow cover make it difficult for the hares to find food and many die of starvation.

Figure 6: number of mountain hares observed during yearly walks from 1973-2017. Data thanks to Val Clinging, SNHS. Years where the walk was shortened due to inclement weather have been omitted and repeat surveys (within one year) have been averaged.



Sadly though, recent unpublished comments have suggested that groups of men with guns have been observed shooting hares on the moors. This may be contributing to the decline in numbers seen since 2011. A big shock in 2017 was only two hares counted east of grid line 21 (Broomhead Moors, Hobson Moss and along Dukes Drive). In past years we have seen dozens here. Our observations correlate with accounts of systematic shooting last winter.

It also remains to be seen whether predicted changes to our weather will affect their numbers in the future. Whatever happens, the SNHS will continue to monitor their numbers in the same fashion.

Mountain hare
© Luke Massey

Access

There is a long history of access to the moorlands and heathlands in the Sheffield area with open access on the majority of the sites now formalised by the Countryside and Rights of Way Act (2000), through individual site arrangements or as a result of status as a 'common'. In addition there are footpaths, bridleways, tracks and small lanes which facilitate access to these habitats.

Together with the adjacent Derbyshire areas the moorlands are often described as Sheffield's 'Golden Frame' acting as a semi-natural backdrop to the city. Along with the wooded valleys, which connect the moorlands to the city and extend through it to its core, they impart much of what makes Sheffield's landscape distinctive amongst the cities of the UK. Together they have led to a recent Sheffield City Council (SCC) initiative to brand Sheffield as 'The Outdoor City'[17]. The lowland heathland areas act similarly in the immediate north of the city.

Many people who visit the moorlands and heathlands do so to experience and appreciate their wildlife, landscapes and cultural heritage. Some also use them for recreation and sport. These areas are increasingly being used for organised events (for example, charity walks), and, in some locations, commercial sporting activities such as rock climbing and horse riding, particularly in the Peak District moorlands. Both of these market their experience on the opportunities the site has for bringing people closer to nature, although this has to be managed to reduce the risk of damage and disturbance to sensitive species and habitats.

Ownership and Management

Of the moorland areas within the National Park, ownership is divided between public bodies (Peak District National Park Authority: PDNPA; SCC; Forestry Commission), conservation organisations (e.g. National Trust; NT), utility companies (Yorkshire Water) and private owners. Within the lowland heathlands, SCC own a larger proportion of sites. Ownership details of 27 target sites covered by the heathland HAP, and more, are shown in Figure 7.

The Peak District National Park Management Plan is recognised as the single most important strategic document for the PDNP. This, together with the SSSI legislation and NE's strategic vision for the uplands, largely determines management of the moorlands alongside the landowners' and managers' business operations and aspirations. Local people are involved in the management of Burbage, Houndkirk and Hathersage Moors through the Eastern Moors Stakeholder group, and in the management of Blacka Moor nature reserve through the Blacka Moor User Forum.

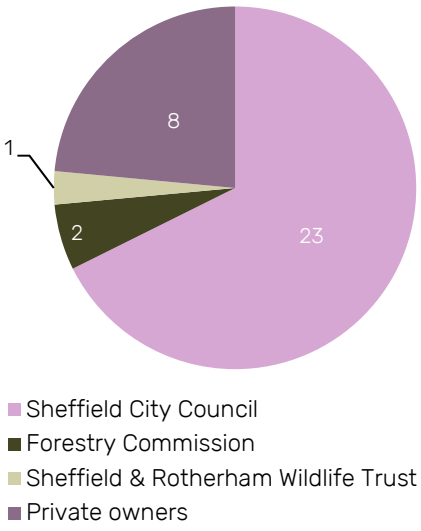


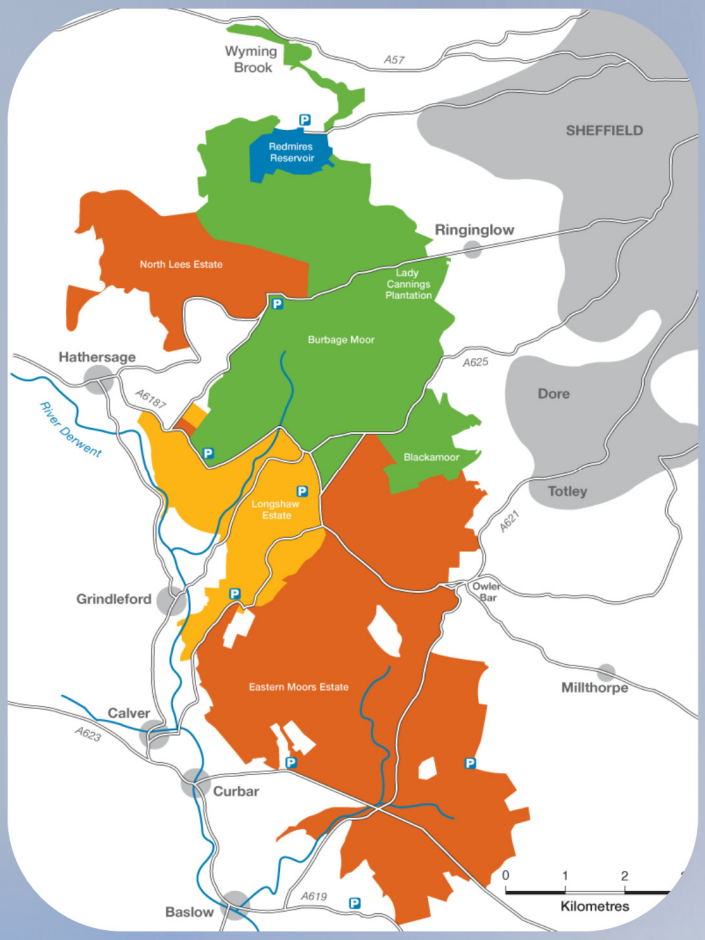
Figure 7: ownership of target moorland sites within the lowland heathlands

Most moorland sites are managed for sheep or cattle grazing and, on many private sites, grouse shooting. Following huge efforts by NE the majority of sites are now managed within a positive agri-environment scheme. This has resulted in a vast increase in the proportion of SSSIs in 'favourable' or 'unfavourable recovering' condition with a current figure of 99% (Figure 5). This compares with just 49% of upland heathland nationally in favourable or unfavourable recovering in 2006 and 73% of blanket bogs[18]. Bradfield, Broomhead and Midhope Estates have had significant moorland restoration plans, funded through the first four to five years of their Higher Level Stewardship (HLS) agreements, including gully blocking/reprofiling and bare peat revegetation work. Whilst HLS capital funding is winding down it is hoped that work can carry on with the help of ML2020 and future Yorkshire Water projects.

Liz Ballard, Chief Executive of SRWT, comments: "*With Brexit on the horizon, the future management and protection of moorlands is uncertain. Many sites have benefitted from significant funding to landowners and managers who have applied for EU agri-environment scheme payments (translated into the UK as Countryside Stewardship HLS). Although the Government has committed to supporting Countryside Stewarship agreements until 2022, as estates come out of current schemes or look further ahead, the future is far from clear. Current proposals outlined in the DEFRA 25-year Environment Plan suggest a new environmental land management scheme may be made available post-Brexit. But details as to how this will operate and the level of funding available have not been confirmed. In addition, there is also great uncertainty as to how EU directives (currently translated through EIA regulations and SAC and SPA designations) will continue in UK law after Brexit. Will these sites be at least as strongly protected as they are now? Where will issues of legal contention and complaint go if not to the European Court of Justice? Whatever the outcome, this will have the most profound effect on the future of our local moorlands and the wildlife they support.*"

Case study: the Sheffield Moors Partnership

The Sheffield Moors Partnership (SMP) covers 56 square kilometres of upland landscape in public sector or charitable ownership straddling the Sheffield/Derbyshire border within the Peak District National Park (see map). The partnership developed in 2010 out of the recognition of the benefits of increased collaborative working for both people and the landscape. The core partners are both local and national, due to the site designations covering much of the area, and include: the PDNPA; NT; SCC; SRWT; Royal Society for the Protection of Birds (RSPB); and NE.



The SMP's aims are to steer delivery across the sites through integrated and holistic planning and thinking, and to develop and deliver a strategic landscape scale masterplan[19] through robust stakeholder and community engagement and consultation. The masterplan (2013-28) has four main themes: access & recreation; being involved; sustainable land management; and recognising the wider value of the moors.

The Eastern Moors Partnership (EMP; between NT and RSPB) looks after the SCC-owned property centred on Burbage, Houndkirk and Hathersage Moors, plus the Eastern Moors from Birchen Edge to Totley Moor on behalf of the PDNPA. This constitutes part of the SMP. A 25-year vision for the EMP sets an ambition for the EMP to be a guiding model of future managment and a new management plan is being published.

SMP was at the centre of the nationally funded Dark Peak Nature Improvement Area project[20]. One of the outputs of this project, which demonstrates the benefits of the SMP approach, was the upgrading of the bridleway network across the area, within and between different landholdings. This work has facilitated access for the people of Sheffield and beyond to the wildlife, landscape and cultural heritage of the Sheffield Moors.

Blacka Moor is a nature reserve in the SMP area and is a rich mosaic of upland habitats on the southwest edge of Sheffield, managed by SRWT. Unlike some of the more intensively managed moorlands elsewhere in the Peak District, the site hosts a ranfge of habitats including open heathland; scrub; woodland; bog; and pasture, making it one of the city's most biodiverse.

www.sheffieldmoors.co.uk

www.visit-eastern-moors.org.uk

View to the Dark Peak © Chris Maguire

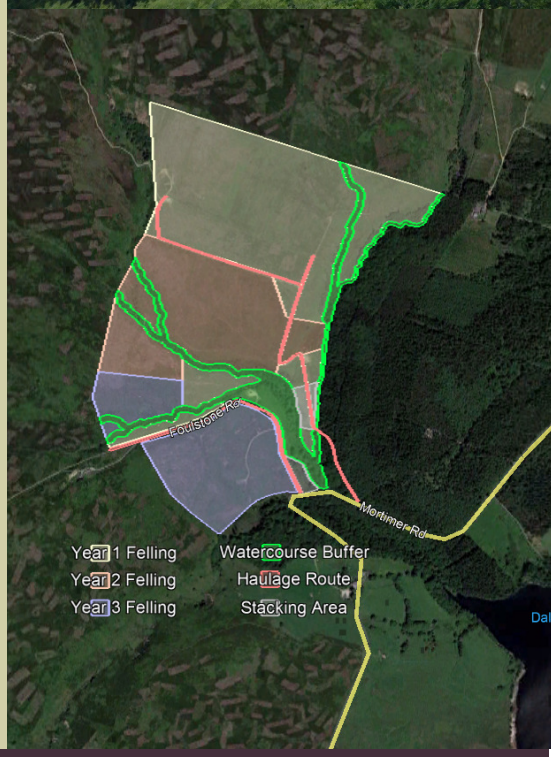
Case study: Bradfield Moorland Restoration Project
Anthony Barber-Lomax, agent for the Fitzwilliam Wentworth Estate

Between 2008 and 2010, 70ha of coniferous forest were felled on the Fitzwilliam Wentworth Estate, to the north-west of Strines Reservoir, with the objective of restoration to a heather-dominated moorland. The project delivered 1% of the UK's and 69% of the Peak District's Biodiversity Action Plan target for upland heathland restoration.

Heather seed, collected from the adjacent moorland, was spread on the majority of the cleared areas with broadleaved trees retained and planted along the streams and gullies to reduce run-off, create small areas of clough woodland and produce a natural looking landscape. Throughout the project the conservation and enhancement of moorland and woodland birds were key priorities. The remainder of the woodland (approximately two-thirds of the original area) is under a long-term management plan which includes enhancement of the ground flora and diversification of the conifers with native broadleaved species.

By 2017, in terms of habitat, roughly a third of the site was considered to have achieved the desired outcome. A further third and the remainder will have achieved the desired outcome within the next three and five years respectively. The site is incorporated into the grazing and heather burning and cutting regime on the rest of the Estate and contributes to the area of value to the grouse management business.

In the years succeeding the felling, golden plover were sighted closer to the old boundary of the woodland than previously. For the past two years – six years after felling ceased – golden plover have been using part of the restoration area. The biodiversity benefits are clear, the restoration of a priority upland habitat with the potential for supporting a wide range of species including birds of national and international conservation concern. In addition, a greatly enhanced visual transition between the moorland and the woodland has resulted in an improved landscape.



Case study: Dark Peak Clough Woodland Project
Jon Stewart, National Trust Peak District General Manager

The NT, working with the Forestry Commission and the MFF Clough Woodland Project[21], has restored and created around 250ha of clough woodland as part of our High Peak Moors Vision. Within the Sheffield area, new woodlands have been delivered in three principal locations in the Upper Derwent Valley: Coldside & Cranberry Clough (25ha), Bosenholes & Howden Clough (11ha) and the Abbey Brook (12ha).

The Clough Woodland Project and MFF wider work is designed to deliver benefits for wildlife within moorland and moorland fringe environments alongside numerous ecosystem services including flood and erosion control, enhanced water quality, carbon storage, climate change mitigation and landscape enhancement.

Woodland planting in the upland valleys and cloughs is one of the five key outcomes identified in the NT's High Peak Moors Vision[22], which covers the Trust's High Peak moorlands stretching from the Sheffield area, across Derbyshire to the western fringe of the Peak District close to Hayfield. Developed in consultation with tenants, partner organisations, experts and local communities, the vision is designed to steer the management of moors over the next 50 years. The other four outcomes are: people being inspired; people looking after the land; vibrant wildlife including birds of prey; and secure and healthy peat bogs.

Woodland clough
© Moors for the Future Partnership

UK Biodiversity Indicator Focus:

Birds of the wider countryside: C5e. Wintering wading birds

Sheffield's moorlands support a number of wading birds over the winter period. Unfortunately, data from the Sheffield Bird Study Group's Breeding Birds of the Sheffield Area 2005-08[6] indicates that three out of seven of these are in decline.

Of the seven local species included in the UK biodiversitry indicator C5e: wintering wading birds (Figure 8), three (43%) had declined in occupancy between 1975-80 and 2003-08 whilst only two species (29%) showed an increase. The major winners and losers of moorland are highlighted below. Oystercatcher and ringed plover are also included in this indicator but, as they are associated more with other habitats, they are not highlighted here. Oystercatcher have shown a vast increase in Sheffield despite declining nationally.

Comparing these figures to national trends for the same species (although it is important to note that these analyses consider abundance) the picture appears less optimistic for Sheffield.

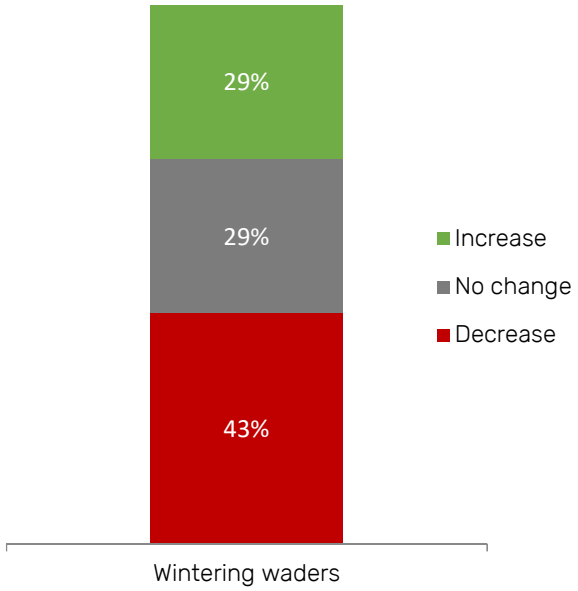


Figure 8: trends of wintering waders included as part of the UK biodiversity indicator C5: birds of the wider countryside, measured as a change in the number of tetrads occupied between 1975-80 and 2003-08[6].

Which species are doing well?

Curlew over the Dark Peak
© Ben Hall/2020VISION

Curlew

Despite not showing an increase in occupancy, curlew have continued to have strong presence within Sheffield's moorlands, with large areas having 'confirmed' breeding in 2003-08 as opposed to 'probable' in 1975-80. They have also slightly increased their range towards the centre of the district.

Golden plover
© Andrew Parkinson/2020VISION

Golden plover

This species has shown notable gains towards the south and east of its local range. They continue to have a stronghold within the Dark Peak region.

What are the reasons?

Habitat restoration

Moorland and heathland management and restoration plans are driving the improvement of sites with funding from Higher Level Stewardship schemes (see Grassland & Farmland chapter). These include substantial capital works projects, such as gully blocking reprofiling and the revegetation of bare peat. Examples include Bradfield, Broomhead and the Midhope Estates. In addition, MFF is restoring areas at Moscar damaged by high levels of recreational pressure. These works are all designed to enhance habitat condition, which in turn will benefit associated species including golden plover.

Which species are not doing well?

Dunlin © Scott Petrek

Dunlin

Dunlin are largely restricted to the blanket bog where they feed on the rich invertebrate fauna. In the wider Sheffield area there has been a 59% decline between 1975-80 and 2003-08[6] with this rate of decline even higher in the Sheffield area, for example, on Ringinglow Bog. Within the district, in 2005-08, only three locations showed possible or probable breeding, with no confirmed sites. Reasons for this are poorly understood, although climate change may well be a significant factor.

Redshank

Redshank have been mostly lost in Sheffield's moorlands. A decline of 44% has resulted in no breeding in the eastern moorlands. Only one location showed probable breeding to the south of the district with breeding confirmed only at Tinsley to the east.

What are the reasons?

Habitat modification

Drainage and improvement of moorland fringe pastures is likely to have had a significant impact on species such as redshank. Development of other habitats such as reclamation of derelict industrial sites has also had a negative impact.

Management

Intensification of farming in moorland fringe areas, including silage production and heavy grazing pressure, has contributed to the loss of suitable breeding and feeding habitat for wintering waders.

Hen harrier
© Amy Lewis

Case study: Upland birds of prey
Liz Ballard, CEO, Sheffield & Rotherham Wildlife Trust

Birds of prey, including hen harriers, goshawks and peregrines, are sadly disappearing from Sheffield's Peak District moorlands (and nationally in the uplands) whilst species such as buzzard, which have been rapidly spreading into adjacent areas, appear to be incapable of establishing populations here. Whilst not neccessarily the sole cause of these declines, there have been several cases of suspected and confirmed illegal birds of prey persecution. At least some of these have been associated with intensively managed grouse moors[23].

SRWT, together with the Wildlife Trusts nationally, believe that a new approach away from increasingly intensive grouse moor management is needed - and soon.

Licensing legitimate law-abiding grouse shoots is an option put forward by the RSPB, or, alternatively, vicarious responsibility making the landowner liable (as in Scotland) is another suggestion. However, their success will depend on adequate policing, sentencing and resourcing to administer and monitor each scheme.

We are working on a range of actions designed to work with moorland owners and managers but also put pressure on those demonstrating bad practices. We are also campaigning to ask the Government to implement changes that ensures that birds of prey have a future on our Sheffield moors.

wildsheffield.com/ourmoors

Case study: Ring ouzels at Burbage
Kim Leyland, Eastern Moors Partnership
Henry Folkard, British Mountaineering Council

Ring ouzel - commonly known as the mountain blackbird - breed in upland locations in the UK. In the Peak District they favour locations in amongst boulders or cliffs or within associated bracken beds. On the eastern Peak District edges, which includes Burbage within the Sheffield area, these are also prime locations for climbing and more general outdoor recreational activities. Hence, since 2003, a unique partnership approach between the PDNPA and the British Mountaineering Council (BMC) has been struck up to help monitor the breeding populations of ring ouzel.

This important partinership has resulted in the maintenance of the breeding population at Stanage Edge despite continued national declines and the loss of the birds from the south-west Peak District. The approach of intensive monitoring, now including BMC volunteers, coupled with very site and time-specific mutually agreed access restrictions, has recently been extended to the Burbage area by the EMP. Nest sites are known from the Burbage crags; Higger Tor; Carl Wark; Houndkirk and Millstone within the order of 11-12 pairs in 2017. Eight of these are confirmed to have bred and six of these successfully fledged at least one brood (Figures 9 and 10). Five of the nest sites were also signed on site to discourage access close to the birds to minimise disturbance. In addition, the BMC holds information on its webpages regarding disturbance to birds and school groups were contacted directly. As a result only a single nest attempt was considered abandoned because of disturbance. Data on nests and breeding success is also recorded from White Edge and Curbar just to the south of Burbage – these areas are also managed by EMP. As at Stanage, the monitoring and signing efforts in these areas also appear to be successfully maintaining the population of these charismatic birds.

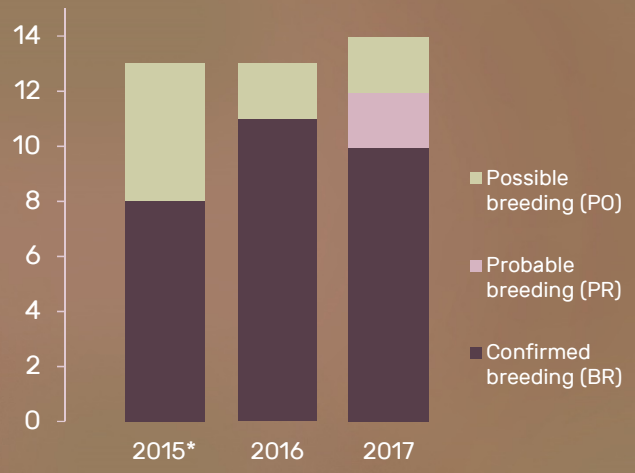


*Figure 9: number of confirmed, probably and possible breeding pairs of ring ouzel recorded. *Note that there was less intensive monitoring in 2015 and that these are numbers found and may not be definitive numbers.*

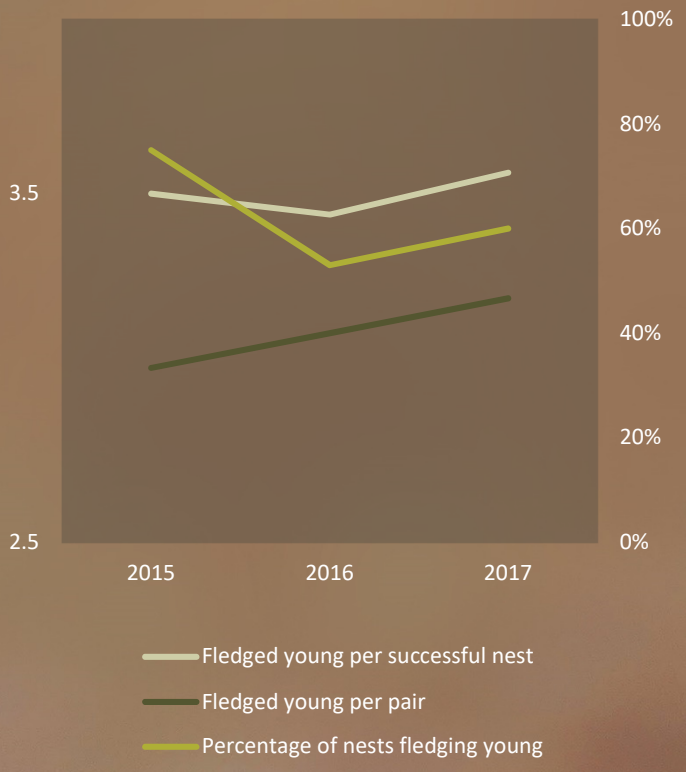


Figure 10: numbers of fledged young per successful nest and per pair (left axis), plus the total percentage of nests fledging young (right axis). These data show that numbers are stable and comparable to other areas of the country without the level of recreational use seen in the Peak District.

Ring ouzel
© Kari Eischer

Threats to moorland, upland and heathland habitats

What is the threat?	What does it cause?	What solutions are being applied?
Overgrazing	Reduction in habitat diversity, particularly the cover and condition of dwarf shrubs, with associated declines in invertebrates and birds	Agri-environment schemes are reducing sheep numbers and encouraging an increase in the number of cattle
Scrub encroachment and colonisation by trees, primarily outside the PDNP	Reduction in the area of upland and lowland heathland habitat	Manual scrub control; introduction of grazing to the lowland heathland sites where this is a particular problem
Burning of blanket bogs	Permanent removal of peat when fires burn not only the vegetation but also the peatland substrate. This is increasingly being recognised as a significant threat	The government is considering a change to the law; NE is encouraging landowners to refrain from burning on blanket bog through the SSSI consent process and agri-environment scheme negotiations
Erosion, primarily of the blanket peat, plus over-grazing, burning and pollution	Removal of the peat and associated vegetation; water quality issues; increase in run-off	Revegetation of the blanket peat has been achieved through restoration projects including gully blocking, seeding, and plug planting sphagnum and cotton grass. This work has been carried out within the Peak District by individual landowners within moorland management plans agreed with NE but also through a succession of nationally and internationally funded projects managed by MFF.
Intensive grouse moor management	Results in poor quality habitat on some moorlands; reduces biodiversity[24]; moorland birds of prey not present or in very low numbers, suspected and confirmed illegal persecution[25]	The SSSI consenting process and agri-environment scheme negotiations are encouraging less intensive moorland management including the retention of areas of older heather
Recreation, notably people and uncontrolled dogs off leads	Disturbance to wildlife (and to farm livestock); erosion	Paving heavily used routes has been shown to increase the area of moorland used by upland birds as people are concentrated onto pathways; 'Take the Lead' (SMP) and other conservation organisation led initiatives to encourage responsible dog walking; Partnership working with recreational groups to encourage responsible use (e.g. Ring Ouzel case study)
Climate Change – see section on Ecosystem Services	Changes to species distributions	-
Changes to agri-environment schemes and funding	Reduction in area of habitat managed within a higher tier agri-environment scheme	PDNPA and NE providing support to farmers/landowners to help them access the mid-tier of the new Countryside Stewardship scheme
Change of land use	Fragmentation or total loss of smaller heathland areas, particularly in the Sheffield Lakeland Partnership area	Sheffield Lakeland Landscape Partnership project will help address this, but on-going wider efforts are needed

Recommendations

1. Develop targeted species conservation plans for key indicator species or local species facing threats or in severe decline such as mountain hare and breeding waders.
2. Tackle declines in local birds of prey by improving habitat, raising awareness and challenging wildlife crime, as well as challenging overly intensive management for grouse shooting applied by some landowners and managers.
3. Actively promote and practically support farmers, land managers and landowners in applying for, and managing, agri-environment schemes, especially as current schemes are replaced following Brexit.
4. Continue to deliver conservation actions that support the return and expansion of nightjar. This includes habitat improvements and ensuring that they are not detrimentally affected by increased recreation and disturbance at key locations.
5. Work with NE and other stakeholders to support and promote the improvement of moorland SSSIs to favourable condition.
6. Focus efforts on improving the overall condition of the two-thirds of key lowland heathland LWSs that are currently in poor condition or not in positive conservation management for wildlife.

Common blue butterfly on heather
© Ross Hoddinott