

2025

Moor Water - Bringing Back Biodiversity

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Severn Trent and Moors for the Future Partnership

April 2020 to March 2025

Many people don't know this, but 70% of the drinking water in the UK comes from remote upland areas like the Peak District. For the past 5 years, Severn Trent has supported Moors for the Future Partnership and the National Trust through the Moor Water project.



What we wanted to achieve and why Severn Trent chose to fund it

Before the works began, blanket bogs in this area had been badly damaged by 200 years of atmospheric pollution, as well as a host of other factors. This had led to a severe loss of vegetation on the moorland plateaux, resulting in vast areas of bare peat exposed to the elements. Thanks to this essential project, the moors are being revived for generations to come.

The project set out to boost nature across remote upper moorland and restore blanket bog, providing a better home for nature on the moors. This also improves the quality

of the water flowing into the reservoirs and slows the flow of water from the hills, contributing to natural flood management in a changing climate.

The UK's blanket bogs are a globally rare resource that, when in good condition, also play an important role in storing carbon, helping in the fight against climate change

The benefits of partnership



Under the Moor Water project, we planted 657 hectares of sphagnum (the equivalent of 920 football pitches).

Under the Great Big Nature Boost project, we planted 917 hectares of sphagnum (the equivalent of 1,284 football pitches).

We engaged with the public at 64 events throughout the Moor Water and Great Big Nature Boost projects, taking the Bogtastic van all over the Severn Trent catchment.

We hosted a range of workshops to engage children and young people in science, natural flood management and fire prevention methods to introduce the next generation to moorland conservation.

We completed reports based on the science and monitoring work we had done on the project. The full reports can be found at moorsforthefuture.org.uk/work/our-projects/moor-water-severn-trent

By working in partnership with organisations like Severn Trent, Moors for the Future Partnership has made great steps forward in its mission to restore the damaged peatlands of the Peak District and South Pennines. It is a relationship that we look forward to continuing as we enter a new period of funding.



Restoration works

We restore bare peat in three broad stages:

- We stabilise and revegetate bare peat
- We work to raise the water table (water stored in the peat to a level that is at or very near the surface), and restore the wet conditions of healthy blanket bog
- We plant sphagnum moss and moorland plants to increase biodiversity

Peatlands are important habitats known for providing a range of ecosystem services. The Bamford catchment, located within the Peak District National Park, contains roughly 16,000 ha of blanket bog peatland; however, much of this is considered to be degraded.

By planting sphagnum moss, the fantastic bog-building moss, the moors are being revived. This means a better home for nature on the moors. In turn, moss is expected to improve the quality of the water flowing into the reservoirs and slow water down, holding it for longer on the moors, contributing to water security and natural flood management. And, as the moss grows, it will trap carbon dioxide from the air and store it as peat.

The objectives of the project – part of Severn Trent’s Great Big Nature Boost – were:

- To complete 613 hectares of biodiversity improvement by planting sphagnum moss.
- To talk to the general public, by taking the amazing Bogtastic van out and about for youth engagement activities and families days and letting people experience a ‘bog in a bus’ for themselves.
- To assess long-term peatland condition and biodiversity change, so we know what state our peatland landscapes are in and what work needs doing to restore them back to full health.
- To assess the sites where restoration work took place, conducting regular vegetation surveys and dipwell monitoring (checking the depth of the water table) to ensure that the work was having its desired effect.
- To conduct a trial of non-chemical bracken treatment
- To improve the quality of water flowing from the catchment
- To reduce flood risk and provide other water quality benefits, such as reduced sedimentation
- To improve climate change resilience and net carbon sequestration

Biodiversity

Upland blanket bogs contain very low levels of nutrients and are vital habitats for special plants, birds and insects, many of which can only live or breed in these special habitats.

Sphagnum mosses are essential for building blanket bogs. A group of sphagnum species unique to these bogs utilise particular 'niches' or parts of the bog, some within pools, others carpeting the surface or forming hummocks. Amongst them are other kinds of mosses, lichens and liverworts. An array of shrubs and berries grow through the mossy understory – heather, crowberry, cranberry, cowberry, and bilberry. There are more conspicuous plants, too, like the common and hare's-tail cotton grasses with their fluffy white seed heads. And in late summer bog asphodel turns blanket bogs a bright golden yellow.

Some of these plants may also be found in other wetlands, but on the blanket bog they support a wealth of insects and

other invertebrates, some now rare because active blanket bog is so rare itself. These invertebrates are important in their own right but they support other wildlife too. In spring, wading birds return to nest on blanket bogs and raise their young. The invertebrates are an essential source of protein for their chicks. But these waders have declined, partly because degraded bogs cannot support them.

Healthy blanket bog helps support a wide range of upland wildlife, including curlew, golden plover, dunlin, hen harrier, black darter dragonfly, and common hawk dragonfly, all making the most of a healthy, thriving habitat.

As bogs gradually return to healthy condition, peatland plants will re-start peat formation and a host of wildlife will once again be a magnet for everyone who loves the moors.

What is the Great Big Nature Boost?

For the Great Big Nature Boost project Severn Trent joined forces with the RSPB, National Trust, Moors for the Future Partnership, the Rivers Trust, National Forest and regional Wildlife Trusts to reduce the use of chemicals and cut carbon emissions.

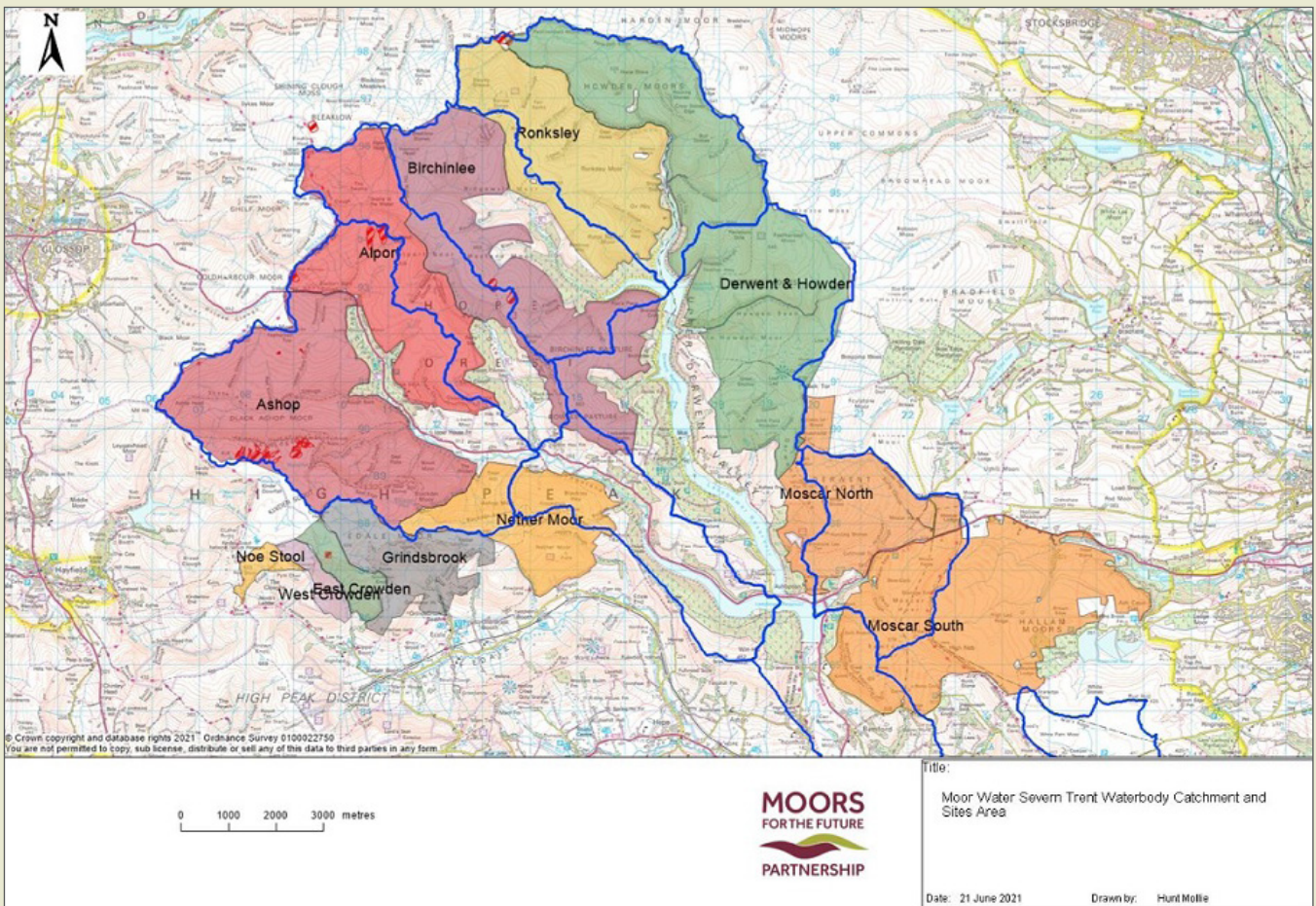
The Great Big Nature Boost allowed the Partnership to build on the success of the Moor Water project, planting more sphagnum, and conducting more public engagement activities over a longer period.





Restoration work

Where is the land being restored and why was it chosen?



The project area lies within the Bamford Catchment in the Peak District National Park and the South Pennine Moors Special Area of Conservation (SAC). The work took place on the Eastern Moors outside Sheffield, and the Roaches in Staffordshire. Work also took place on Birchlee, Ronksley, Bamford and Derwent Moor, on tributaries leading into the Derwent Valley reservoirs.

What is sphagnum?

The planting of large quantities of sphagnum moss was the key objective of the Moor Water project.

- Sphagnum moss is a key component of blanket bogs
 - Sphagnum can hold up to 20 times its weight in water
 - Sphagnum holds back water - reducing the risk of flooding in the valleys below the moors
 - Each kind of sphagnum moss has its own shade of colour, ranging from red, pink and orange through to green
- Some grow underwater in pools and wet hollows whilst others can survive in fairly dry conditions
- Hummocks are created by sphagnum mosses growing to form large mounds up to a metre high
 - Some mosses grow only a few millimetres a year, while others grow over 3cm
 - Mosses grow from spores which are produced in fruiting bodies called capsules
 - Sphagnum mosses produce chemicals which increase the acidity of the water and further prevent the decay of dead plants



Planting sphagnum

Research has shown that the most effective way of planting sphagnum is by hand. Each 50p-size sphagnum plug contains a number of different sphagnum species to ensure that one will suit the environment into which it is inserted.



Science & monitoring

Five sites were selected to monitor the success of sphagnum plug applications within the Upper Derwent catchment. These sites were chosen to encompass a range of different vegetation states

Why was science important to this project?

Much of the UK's drinking water (70%) is derived from surface water that originates mainly from upland catchments such as the Peak District moorlands. Regular scientific monitoring helps us understand the flow of water, whether it is fast or slow, and ensures that the peat remains in place. If the water is clear, that's a good sign. If it looks like tea, then it contains peat, indicating that the land requires further care and attention from us.

On a healthy bog, the mix of plants makes the surface of the land rough. As so much rainwater passes over and through them, when it rains heavily, they significantly slow the flow of the water. This makes a huge difference to how long it takes for that water to get to the bottom of the hill. Keeping the water on the hill at source for longer reduces the likelihood and impact of flooding in the watercourses below. We monitor the water table (depth of groundwater beneath the surface) to ensure that most of the water is being kept in place, as we want it to.

Monitoring also helps identify long-term trends that might affect water availability to local ecosystems and downstream communities. It provides the information and evidence we need to ensure that our conservation efforts are effective in achieving our goals of improving water quality, enhancing our understanding of Natural Flood Management methods and increasing biodiversity.

- Measurements help us to identify if our conservation work is successful at raising the water levels, known as 'water tables', across the moors
- A high water table is critical for blanket bog to become active (growing peat rather than losing it) because when the slightly acidic ground is wet, decomposition can't take place so the vegetation instead forms new peat. The wet peat also helps reduce fire risk
- A high water table is an important factor for keeping bogs in a favourable condition

How do we measure water quality?

We monitor how water behaves to see if our work is affecting it. We seek to find out whether any changes are beneficial and fulfil our objectives.

A well-vegetated moorland has a rough surface, which slows the speed of water flowing over it and into watercourses. When water flows quickly, as it does on bare or degraded peat, it carries material with it, both over surfaces and within streams and gullies. Peat comprises about 50% carbon and heavy metals. Both pollute drinking water, which requires expensive treatment before it reaches our homes.

We have field labs on many of our work sites with dipwells (tiny wells to measure the depth of the water table), and rain gauges and v-notch weirs to measure the flow of water from the moor. Much of the work involves regularly downloading data from loggers and taking manual measurements.

Advanced technology means that readings and samples are taken automatically, but sites need regular attention. We routinely collect samples and download information collected by data loggers.

During our annual dipwell campaign, we measure the depth of the water table in hundreds of locations. Staff and volunteers take measurements to see how wet the moors are. They are checked manually by a team member who blows into a plastic tube as it is lowered into the well. When the tube reaches the water, bubbling is heard, and the resulting depth is recorded. This approach might seem low-tech, but it has been proven to be the most reliable!

The measurements help us to identify where our conservation work is successful at raising the ‘water tables’ across the moors, which is an important factor for keeping them in a favourable condition.

How peatland supports a biodiverse ecosystem

Peat is a globally rare resource as it only forms in areas of the world that have high rainfall, poor drainage and cooler temperatures. In the British Isles, we have around 10–15% of the world’s peat habitat – some peatland species are unique to the UK. Worldwide, peat is a rarer habitat than tropical rainforest! This catchment area is a Special Area of Conservation that contains one-third of the UK’s blanket bog habitat.



Bracken control sites

Overview of trial, measurables & early data

Why do we research mechanical bracken management?

Bracken is a native fern to the UK and is what you often see in large quantities when out walking in the hills. However, it is a tall, dominant species that is poisonous to eat for most animals, and so it can rapidly spread and limit biodiversity by out competing other plants. Until 2024, chemical control of bracken through the use of the herbicide Asulam was one option available to land managers.

The Moor Water project presented an opportunity to trial non-herbicidal methods to control bracken.

Severn Trent supported this trial as they were concerned to find ways to stop herbicides entering the water supply.

Many previous studies have taken place investigating the efficacy of controlling bracken through repeatedly cutting or bruising the plant. An additional trial was set up in the Peak District to test the efficacy of non-herbicide control by cutting and mulching bracken fronds once a year in late summer after the bird breeding season. After two years of treatment, frond height and litter cover were reduced, while the growth of other flora increased in two of the three trial plots.

The trial explored the potential of a mechanical bracken management regime that is simple, to help the financial sustainability of its application while avoiding the use of herbicides.



Sphagnum plug trials

Overview of trial, measurables & potential

Peat is formed from Sphagnum moss, accumulating at only 1mm per year. The lack of oxygen in peat slows the rate of decomposition, storing carbon in the ground as it forms. It's nature's way of limiting carbon release.

The centuries of peatland degradation (from factors including agricultural exploitation, commercial afforestation, outbreaks of wildfire and atmospheric pollution) led to Sphagnum mosses disappearing. Sphagnum is the defining species of peatland ecosystems. Extensive areas of bare peat were subject to deep erosional gullying. These changes lead to substantially increased emissions of carbon dioxide, reservoir infilling (the build-up of sediment), discolouration of water and a loss of habitat.

Sphagnum plugs were introduced at five sites within the Bamford Catchment, each with different starting conditions. Vegetation diversity, cover and sphagnum plug survival and growth were monitored, following guidance defined by Common Standards Monitoring (CSM), according to standards established across the UK.

At the close of the Moor Water project, the Moors for the Future Partnership monitoring team observed that 88% of plugs survived the monitoring period, and most surviving plugs underwent some growth, with growth rate and survival varying by site.

Indicator species frequency (species whose presence, absence or abundance reflects specific environmental conditions) was increased by the addition of plugs.



Communications & engagement

What is the Bogtastic van, and where did it go?

The Bogtastic van is our popular ‘bog in a van’, a unique audio-visual experience that we take to events and locations around the Severn Trent area, engaging with members of the public and explaining our work and the importance of moorland restoration.

With its ‘bouncy bog floor’ and video of moorland sights and sounds, the van is a way of taking the moors to people in locations where they might not experience them first-hand.

Over the course of the Moor Water and Great Big Nature Boost projects, we engaged with the public at 64 events.

What youth engagement did we do and where?

Aided by youth engagement rangers from the Peak District National Park Authority, we welcomed young people to the Moorland Discovery Centre at Longshaw, taking them on to the moors to take part in simple science experiments, and to learn about the Water Cycle and natural flood management. They also took part in workshops around fire prevention and best practice on the moors.

It is crucial to engage the next generation with the importance of the landscape around them, and how to protect it. We liaised with the MiniPolice (a volunteer engagement scheme for primary school children aged 8 to 11 years old) to reach schools in areas that would not always have access to nature, to help boost their understanding of the natural world around them.



Farmer & land manager events

What we did

It is important that the work we do receives support from the farmers and land managers as it will probably impact on their livelihoods most immediately, and they know the land on which we're working better than anyone. With this in mind, we organised two events:

- A demonstration of the non-chemical bracken control techniques we had been trialling.
- An event to allow local farmers and land managers to ask questions to the team from Moors for the Future Partnership and Severn Trent.

Social Media

The best way for us to let the public know what work we've been doing is by posting updates on social media. We use Instagram, Facebook, X, Bluesky and LinkedIn to post regular updates on how the project is going and what we've been working on.

We contributed regular social media posts highlighting our work under the Moor Water Severn Trent project and its positive impacts on biodiversity and water quality.

What we discovered

The input of farmers at the bracken control event shed much light on the techniques they used and informed the shape of the methods we trialled going forward.



The conference

As part of the Moor Water project we hosted the Moors for the Future and Severn Trent 2024 conference: What Green Financing for the Uplands can do for Business. The event facilitated lots of important conversations about the future of natural capital financing and was well attended by organisations such as Defra, the Environment Agency, Natural England, RSPB and the National Trust.

Wildfire prevention

The importance of wildfire prevention is always present in our messaging, as moorlands are very vulnerable to fire, and the careless use of campfires or barbecues can cause massive amounts of damage. Thus, on social media, and in public engagement, the 'Be Fire Aware' message is always part of the conversation with the public.

The film

We created a short film, detailing the link between restored moorland and cleaner water, as well as the improvement to biodiversity that this brings. <https://www.youtube.com/watch?v=uVFZCgmrPSg&t=4s>



Photography posts

We installed fixed-point photography posts at five sites around the Peak District National Park, to enable people to engage with conservation work that had taken place recently on the moors in the Bamford Catchment. When people come across the posts, they are invited to take a fixed-point photo of the landscape and to upload their photo. The viewpoints take in areas of moorland restored by Moors for the Future Partnership under the Moor Water Severn Trent project and areas of clough woodland restored by the National Trust, funded by Severn Trent, providing a view on the gradual growth taking place there, as well as the changes in the seasons. The photos can be seen here. <https://www.moorsforthefuture.org.uk/our-work/our-projects/moor-water-severn-trent/record-moorland-change>

Reaction to our social media about the fixed-point photography posts was huge, reaching 17.5 million accounts, and receiving 10,000 likes, 6.5K comments and 8.6K shares.



Green sketching

Working with Dr Ali Foxon we produced a Green Sketching Guide to the Peak District, encouraging members of the public to experience the unique landscapes around them in a mindful way.

You can download your copy here.

https://www.moorsforthefuture.org.uk/_data/assets/pdf_file/0030/99750/Drawn-to-the-Moors-2024.pdf



About Moors for the Future Partnership

Moors for the Future Partnership was established in 2003 to protect damaged blanket bog habitats across the Peak District and South Pennines. It provides evidence-based conservation, backed up by innovative public engagement.

Moors for the Future Partnership is led by the Peak District National Park Authority. It receives financial support from the Environment Agency, National Trust, RSPB, Severn Trent, United Utilities, Yorkshire Water, and support and advice from Natural England, National Farmers Union, Heather Trust, Woodland Trust, ethical finance sector and the British Mountaineering Council.

About Severn Trent

Severn Trent supplies essential Water services such as drinking water and all sewerage services to millions of homes and businesses across the Midlands and beyond. Around eight million people across the Midlands receive their water and sewerage services from the company, activities which lay the foundation for ST's extensive work in the conservation of landscape and biodiversity. The company owns and manages 20,000 hectares of land and water in England and Wales and launched its Biodiversity Action Plan in 1999.



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