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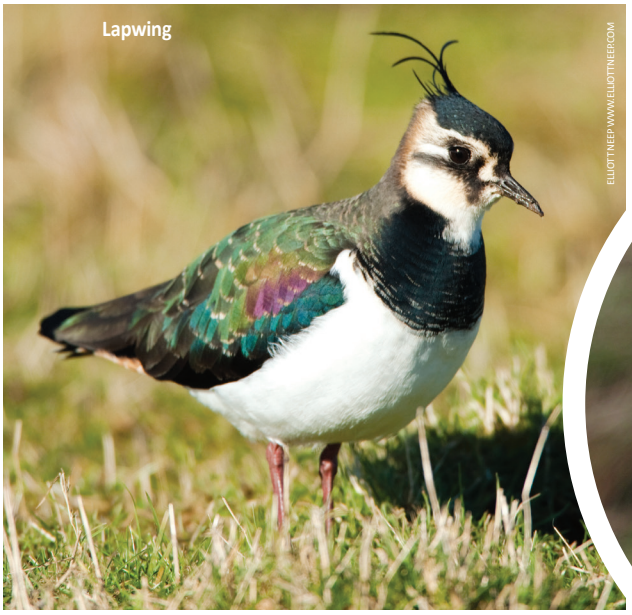
What is Yorkshire Peat Partnership?

Yorkshire Wildlife Trust

The Yorkshire Peat Partnership (YPP) began in 2009 as an umbrella organisation comprising Yorkshire Wildlife Trust, Yorkshire Dales National Park Authority, Natural England, Environment Agency, North York Moors National Park Authority and Yorkshire Water. We receive support from Nidderdale AONB, National Trust, The Moorland Association and Pennine Prospects. YPP also works closely with landowners, agents, gamekeepers, farmers and contractors to help restore Yorkshire's internationally important peat bogs.

The area YPP works in is vast and there is surveying, restoration and monitoring throughout the Yorkshire Dales National Park, Nidderdale AONB, North York Moors National Park and northern parts of the South Pennines.


Lapwing

ELLIOTT NEEP WWW.ELLIOTTNEEP.COM


TESSA LEVENS

Cotton grass

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Why are we needed?

Walkers in the South Pennines

Peatlands are a unique and valuable habitat of which only 4% remain undamaged in the UK. Yorkshire alone contains nearly 70,000 hectares of upland peat almost all of which has been subject to drainage, wildfire, overgrazing or recreational pressure. These factors lower the water table and expose the peat to the erosive forces of water and wind.

Healthy peatlands sequester carbon but damaged peatlands become a carbon source through the release of CO2, dissolved organic carbon and particulate organic carbon. Peat entering watercourses affects drinking water quality and aquatic biodiversity. The species that inhabit peatlands are often specialised and unable to survive when conditions alter. Archaeology degrades as it is exposed by peat erosion and the upland landscape changes as underlying mineral is exposed and vegetation is unable to establish.

YPP can aid the recovery of peatlands through restoration work such as blocking drainage channels and revegetating bare peat.

TESSA LEVENS

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Objectives

The Yorkshire Peat Partnership's objective is to substantially increase the amount of peatland restoration activity in Yorkshire's uplands through a combination of restoration, management and monitoring.

Through our work we want to preserve the peat that remains and help to reinstate functioning, peat-forming ecosystems. This will help restore the hydrological processes, increase biodiversity and reduce the amount of carbon loss.

YPP aims to collect vital information through our monitoring and research that may contribute to the development of peatland restoration science and guide future restoration techniques.


JOHN SKEFFINGTON

Pre-restoration survey


DAMIEN WATERS

Curlew

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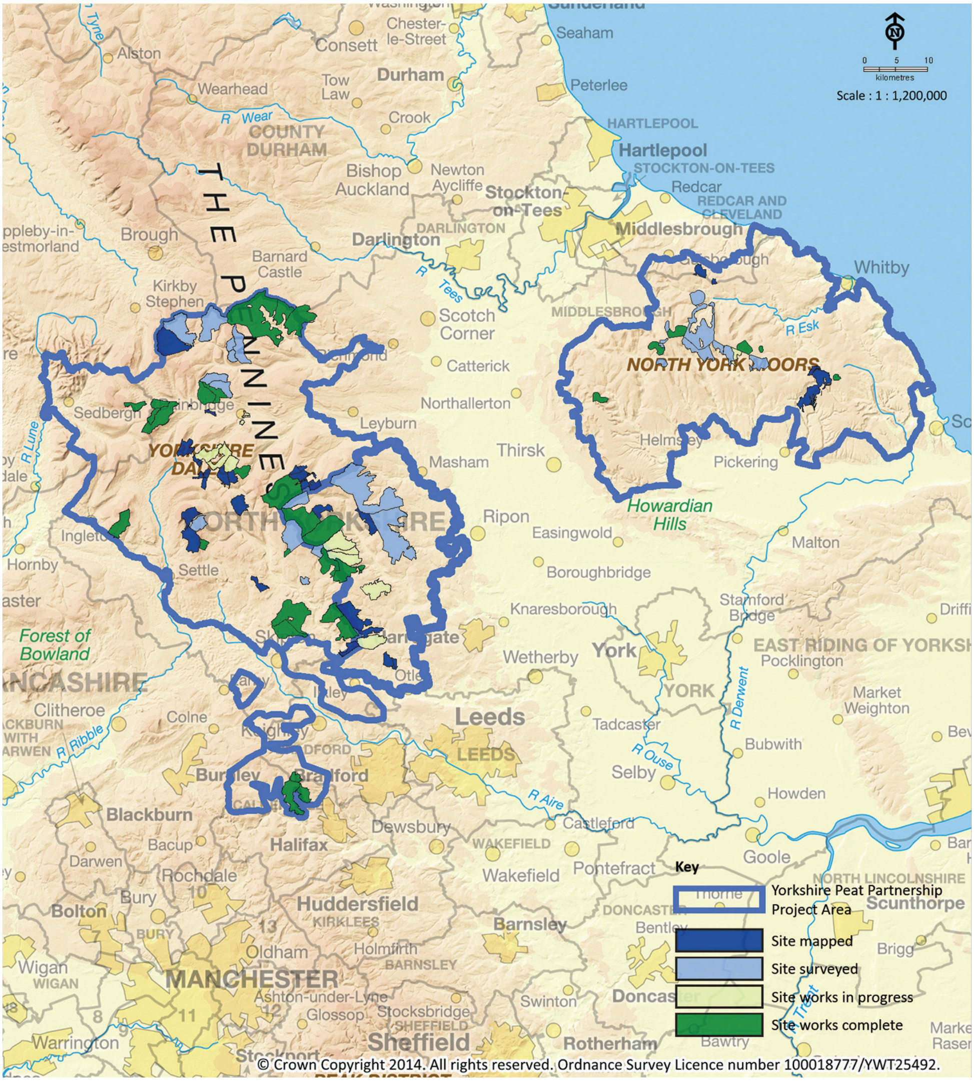
Restoration achieved

The map below shows the location and stage of YPP's work. Up to April 2014, 21,384 hectares of peatland had restoration work completed or underway. We had blocked 2,175km of grips, restored 9,86km of gullies and hags and re-vegetated over 100ha of bare peat. This is well on the way to achieving our target of restoring 50% (35,000ha) of damaged peat in Yorkshire by 2017.



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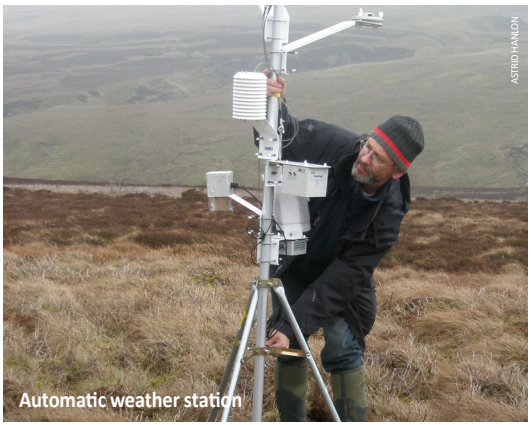
Research Projects

YPP fund and support a number of research projects aimed to further our knowledge of peatland ecosystems and inform the future of peatland restoration. Large-scale projects include the palaeoecological reconstruction of moorland sites in order to support restoration work, investigating the restoration of blanket bog vegetation for biodiversity, carbon sequestration and water regulation. Smaller projects range from investigating revegetation following grip blocking, peat depth measurements, stakeholder conflicts and synergies and the impact of management scenarios on ecosystem service resilience.



Automatic weather station

Surveys

Before any restoration work takes place, YPP assesses each site using 3 stages of surveying. There may also be additional stone dam and Unmanned Aerial Vehicle (UAV) surveys on complex sites.

Pre-survey: This is the initial desk-based survey for which we use aerial photography in MapInfo GIS to digitise visible grips, gullies, peat hags and bare peat so that they can be located during the field survey.

Field Survey: The digitised features identified during the pre-survey are uploaded onto hand held GPS mappers and we carry out a detailed survey of the erosion on site. We look at the width and depth of channels, height and slope of hags, note the type and extent of bare peat, and record vegetation communities and peat depth.

Post-Survey: We use MapInfo and a combination of aerial photography and the field survey data to classify erosion features according to their type and size. The quantities are entered into a Restoration Plan which is ultimately used to determine the cost of the restoration work.

If stone dams are required, an additional field survey is used to record suitable stone dam locations. This ensures dams are at their most effective and that the stone can be dropped nearby from a helicopter lift.

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Monitoring achieved


ASTRID MANLON

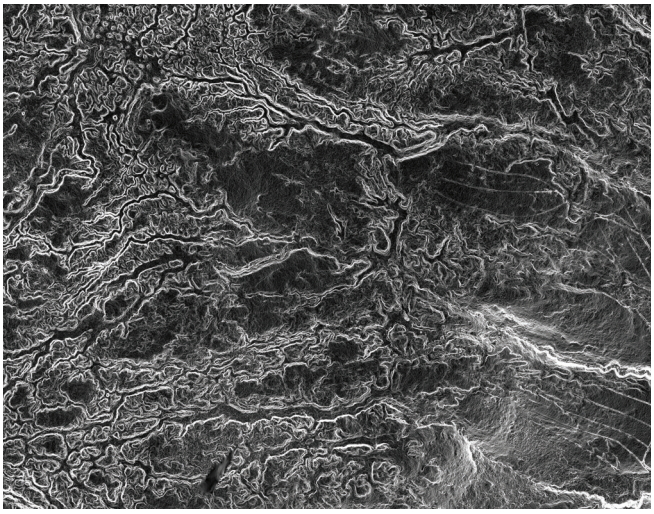
Vegetation monitoring

YPP is committed to detailed monitoring to assess the impact of restoration on vegetation, hydrology and sediment dynamics. To date, YPP has established 4 monitoring sites containing 170 fixed point quadrats and recorded 5,100 data points using GPS. At each point variables such as peat depth, vegetation type, Sphagnum presence and fine-scale topography are recorded. The potential number of data records collected could be as many as 152,000! Additionally, detailed vegetation monitoring will enable YPP to adopt a proxy approach to help quantify greenhouse gas emissions.

Remote sensing & UAV

For complex sites with intense networks of gullies, hags and bare peat we use a UAV to accurately map erosion features at the site. Subsequent geospatial analysis of this data allows us to model surface topography and hydrology in order to understand and quantify where best to carry out restoration work. By using this methodology to inform the restoration process we are better able to target our resources than would be possible using aerial photographs alone.

MARK BROWN



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Grip blocking

Grips (man-made drains) have been dug across much of Yorkshire's upland peatlands. Many have become badly eroded and the impact of drainage combined with other factors has led to the development of large eroding gullies in many areas. By blocking these grips, YPP can help to restore the water table and prevent further peat erosion.

Grip blocking techniques vary depending on the condition of the grips so they are surveyed prior to restoration. Some grips have been blocked by vegetation and require no work. The grips that are still able to flow are categorised according to size. Those up to 2m wide can have dams installed to restore the natural hydrology and prevent continued erosion. Dams are not effective for blocking most grips larger than 2m wide so these require other techniques used for gullies.

CERI KATZ

Peat dams in Coverdale

Peat dams are used in smaller grips where less erosion has occurred. Peat is gathered from the base of the grip or alongside it and is used to create a wedge-shaped dam that is wider than the grip either side to prevent water flowing around it. Dams are built higher than the surrounding ground

TESSA EVENS

Peat dams in Littondale

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Demonstration of techniques

Unblocked grip

level to account for subsidence as they age. A small, crescent-shaped overspill channel is created on the down slope side of the dam to ensure excess water is dispersed without causing surface erosion. Average spacing of the dams is 7.5m but this is adjusted depending on gradient and vegetation conditions. Bare peat, including the top of the dam, is revegetated using previously set aside vegetation to prevent oxidisation of the peat.

Stone dams are used in grips measuring between 1m and 2m wide or in smaller grips where erosion is down to the mineral layer. Heather bale dams can be used as an alternative where peat is shallow.

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Gully management

Some of the grips in Yorkshire's upland peatlands have become so badly eroded that they have become sinuous gullies. Other factors such as wildfire and over-grazing have led to the development of large eroding gully systems in many areas.

Gullies are surveyed by YPP and the extent of erosion is taken into account when determining how to treat each gully. The objective is to reduce water flow to enable trapping of sediment or, in larger gullies, stabilisation and revegetation of the eroding, hagged sides to prevent further collapse and widening of the channel.

Peat dams, as used in grips, are effective in gullies up to 1m wide. Stone dams are used in gullies measuring between 1m and 2m wide to slow the flow of water and trap peat sediment. YPP carries out a further survey of grips and gullies requiring stone dams and identifies a suitable location for each dam. The stone is air-lifted to points close to the dam locations and dams are built by hand. They measure

MIRANDA JAKES

CERI KATZ

Erosion has caused this gully to form in West Yorkshire


STEVE MARSDEN

The sides of gullies wider than 2m are reprofiled and then revegetated


The team survey the extent of erosion in Yorkshire's peatlands


TESSA LEVENS

Stone and brash is air-lifted in to make repairs

between 0.5m and 1m high with a mix of stone sizes and are higher at each side than in the centre to prevent scouring around the sides. Dams have a steep face on the upstream side and a slope of 45° on the downstream face.

Gullies wider than 2m are too large to dam so Yorkshire Peat Partnership reprofiles the eroding sides to a moderate angle of 33-45°. The newly angled slope is revegetated with the previously undermined vegetation. Turves from adjacent to the gully can be used to fill small gaps. Where there is insufficient existing vegetation, heather brash can be spread in the same way as on bare peat. This reprofiling technique is also used on isolated peat hags not associated with gullies.

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Bare peat restoration

Exposed bare peat in upland regions is caused by a number of factors including livestock poaching and overgrazing, vehicle damage, peat extraction for fuel use and the most widespread cause; wild or badly managed fires.

Peat without a vegetative cover is unstable to the extent that the erosive forces of wind, water and livestock easily facilitate the rapid stripping off of peat, often down to the subsoil, mineral or bedrock. Eroded peat is usually washed into watercourses along with silt from any mineral base material that has become exposed as the peat is removed.

The technique most commonly used by YPP to revegetate bare peat is to spread heather brash that is rich in bryophytes that grow naturally on wet heath or drier peat bogs. The brash stabilises the peat surface and creates microclimates for vegetation to establish. Sphagnum species are

Heather

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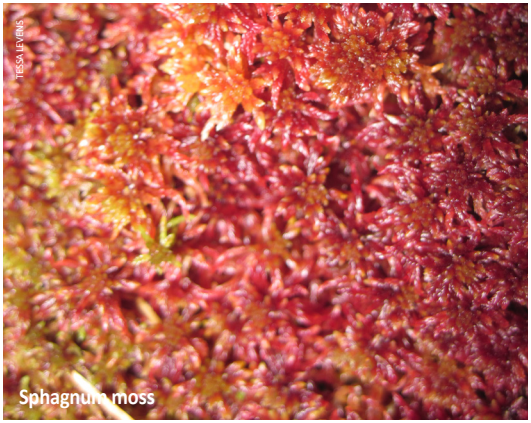
spread onto the bare peat areas at a rate of approximately 80 capitulum heads per m² along with a dwarf shrub seed mix of 90 : 10 *Calluna vulgaris* : *Erica tetralix* at a rate of 650g per hectare.

If donor sites are used for brash and Sphagnum, it is important that they are treated as sensitively as the restoration sites. Checks must be done to prevent the spread of disease or infestations to the restoration site.

Sphagnum mosses and crowberry

Sundew



Sphagnum moss

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IUCN-UK

The IUCN Peatland Programme was created in 2009 to meet an overwhelming need to raise awareness of peatland restoration in the UK. Improving the understanding of peatland functions such as greenhouse gas emissions, promoting knowledge exchange between the peatland community, informing policy and legislation up to EU level and promoting good practice are some of the core objectives that the programme champions. YPP fully supports the work of the IUCN and contributes by providing information and promoting its vital work at any opportunity.

Adder - a moorland species

Peatland code

It is widely recognised that the restoration of UK peatlands is crucial for tackling climate change, wildlife conservation and water management. The UK Peatland Code is the voluntary standard for UK restoration projects that want to be sponsored on the basis of benefits such as climate change and it is built on an extensive body of research into the benefits of peatland restoration. The code is set up to provide a mechanism for businesses to sponsor peatland restoration motivated by corporate social responsibility and the code assures that restoration will deliver benefits such as climate change mitigation amongst many others. YPP believes such a code is vital for the future of peatland restoration and will endeavour to support the roll out of the code in the Yorkshire uplands wherever possible.

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karrimor
GORE
PETER CHRISTOPHERSON

Further funding...

From March 2015 the current Yorkshire Peat Partnership model will come to an end. There is still funding for peatland restoration through agri-environment schemes but no funding to support the YPP team. If we are to continue to build on the success of the last 5 years we need to secure new funds.

Our first step is the Pennine PeatLIFE bid together with bids to other grant awarding bodies and we continue to discuss funding options with Natural England and the Environment Agency who have supported us so well over the last 5 years.

Yorkshire Water has identified a programme of restoration works as part of its next submission to OFWAT and we hope to be involved in this. We are also looking at how we might provide a consultancy service to other projects particularly based around our GIS & Remote Sensing capabilities.

Next steps...

The Yorkshire Peat Partnership has been very successful in delivering peatland restoration across the uplands of Yorkshire. We need to keep up the momentum to achieve the target of 50% of blanket bog under restoration by 2017.

In 2013 we worked with partners in Lancashire and the North Pennines to look at how we might be able to work together more efficiently to deliver blanket bog restoration across the Pennines. This lead to the establishment of the Pennine Peat Partnership, a network of organisations working together to try to deliver an estimated £50million of work across the region. The first project the Partnership is working on is the Pennine PeatLIFE bid to the European LIFE fund which, if successful, will deliver £9million of restoration work over the next 5 years.

COVER IMAGE: MATTHEW ROBERTS

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