

PATHWAYS TO NATURE-BASED SOLUTIONS

Highlights and recommendations
from the Soar Nature-based
Solutions Project





The Trent in flood- credit: Helen Johnson, NTU

Introduction

The UK is facing serious challenges, from biodiversity loss and the impacts of climate change. Particularly the increasing risk of flooding, has had a devastating effect on communities. The Midlands were amongst the regions that suffered immensely following severe floods. It is clear that communities want answers and solutions to help address the increasing threat.

The way we manage our landscapes and rivers is a vital part of the solution – in restoring nature to slow the flow of water, wetter, more absorbent landscapes can lower and delay the flood peak and give people more time to prepare.

As part of the Aviva x WWF partnership, our work in the Soar catchment created room for a more strategic approach encouraging uptake of Nature-based Solutions (NbS) in the catchment. It created the opportunity to challenge the lack of Nature-based Solutions, engage communities, landowners and key stakeholders, educate and deliver natural flood management on the ground.

Lucy Lee, UK Chief Advisor at WWF said:

“Nature-based solutions are a powerful tool in tackling the UK’s climate and biodiversity crises, yet they remain underutilised. The work led by Trent Rivers Trust and supported by Aviva and WWF has demonstrated both the potential and the challenges of implementing Natural Flood Management (NFM) at scale. To truly mainstream these solutions, we need stronger policy frameworks, better financial incentives for landowners, and a more integrated approach to land use planning. By investing in nature, we can build more resilient communities while restoring vital ecosystems.”



A river connected to its floodplain - Credit: Trent Rivers Trust

Waseem Malik, Chief Claims Officer, UK & Ireland General Insurance at Aviva, said:

“Over the past year the UK has seen several named storms leading to flooding in many areas and sadly, some residents have been flooded on more than one occasion. As our climate changes, extreme weather events will become more commonplace and we need to bolster flood risk management. In many places, the volume of rainwater falling will overwhelm our rivers and drains and it won’t be possible to prevent flooding from happening.

This report shows that a holistic approach, combining physical barriers with nature-based solutions and resilience, will give us the best chance of reducing the impact of flooding in years to come.

Greater awareness and more investment in natural flood management solutions will be needed to make change happen. We believe there should be greater investment in nature-based solutions in the future and our research suggests there is also appetite for this from residents.

At Aviva we’ve already pledged over £80million towards nature-based solutions projects across the UK which will run for several years, working to capture carbon, contributing towards flood resilience and helping to restore natural habitats. They have a valuable part to play, not only in flood management but also in mitigating other climate risks, such as wildfires. By combining these natural measures with physical flood defences and resilience measures, we can help protect more communities from future extreme weather.”

Nature-based Solutions rely on a collaborative approach and will gain momentum as knowledge is being shared and skills develop. This summary report aims to provide local insight into the delivery of natural flood management and flood resilience initiatives. We hope more communities in the UK benefit from more resilient rivers and landscapes.



About the partnership

From 2021-2024, WWF and Aviva worked together to restore UK landscapes, build healthier, more resilient communities and help transform one of the biggest indirect drivers of climate change: the UK finance sector.

Over three years, they've worked with nature to tackle the climate and biodiversity crises, helped to change political policy and public opinion, and connected tens of thousands of people to the natural world across the country through community volunteering, local engagement and events, and educational opportunities.

This partnership enabled TRT, as a team of water management specialists, to explore the challenges around the delivery of NbS to reduce flood risk, including capital work, through technical support and funding.



Acting on climate change to build a better tomorrow

About Trent Rivers Trust

Trent Rivers Trust is a charity that specialises in the delivery of Nature-based Solutions to restore and protect rivers, for people and for wildlife. It is the only organisations that covers the entire Trent catchment, where promoting sustainable water management is its key focus. The organisation employs experts in rivers, water, agriculture and engagement.

TRT has been involved in and delivering natural flood management across the Trent catchment since the first Defra trial in 2016 and is set up to work directly with farmers and communities to create NFM schemes that reduce flood risk and are supported by landowners.



Ruth Needham TRT's Head of Landscapes and partnerships launching a partnership-funded toolkit targeting landowners with advice on NFM on their land.



Credit: Trent Rivers Trust working in the Moat brook catchment near Loughborough

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Credit: Greg Armfield, WWF UK

Context

Nature-based Solutions (NbS) offer far reaching opportunities for flood risk reduction and nature recovery; a unique and increasingly vital technique that distinguishes them from hard-engineered solutions.


As the effects of climate change grow more frequent and intense, NbS can have an impact where traditional schemes typically cannot. Yet, NbS sit on a crowded map with competing interests; housing, food production and infrastructure place critical and lucrative demands on land use.


Drawing from first-hand experience, local rivers charity, Trent Rivers Trust, presents this summary report as part of its partnership with WWF and leading insurer Aviva.


It is a call for nature to become our first line of defence and the need to make space for water. This summary report presents fresh evidence on NFM's potential to reduce economic damage and flood risk, reflects on key insights and learnings and makes recommendations for an improved framework.

Key figures


As part of this partnership project, Trent Rivers Trust successfully delivered NFM schemes and community engagement initiatives in the Soar catchment, where about 12,000 properties lie within the floodplain, some already protected by conventional infrastructure.

 5,500 m³ predicted water storage

 276 interventions when finalised

 453,942 people reached

 6,357 interactions

 464 people taking action to increase flood resilience

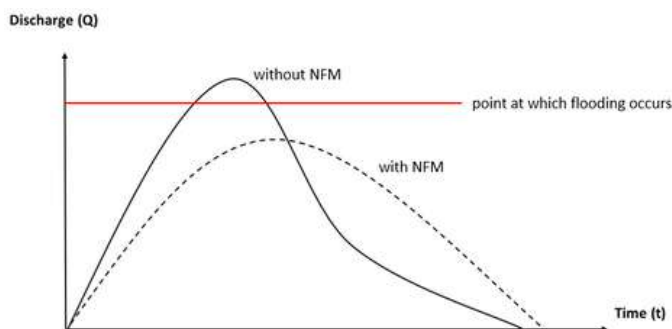


Credit: Trent Rivers Trust

What are NbS and NFM?

NbS can leverage nature and the power of healthy ecosystems to protect people, optimise infrastructure and safeguard a stable and biodiverse future. NbS are vital to help us adapt to and mitigate the effects of climate change.

NFM falls under the umbrella of NbS, specifically focusing on the reduction of flood risk within a catchment. The solution aims to slow the flow of water to allow more time for communities to prepare for flooding.



NFM reduces and delays the flood peak. As shown in the graph above, the same volume of water is spread over a longer period of time, reducing flood risk to communities downstream.

To slow the flow, various natural methods can work with the environment to hold water back. NFM relies on one, or a combination, of the following underlying mechanisms:

- Slowing water in-channel by installing leaky barriers
- Temporarily storing water using ponds, wetlands, and floodplains.
- Interrupting overland flow by planting buffer strips or creating bunds.
- Increasing infiltration through good soil management.



Credit: Greg Armfield, WWF UK picturing overland flow

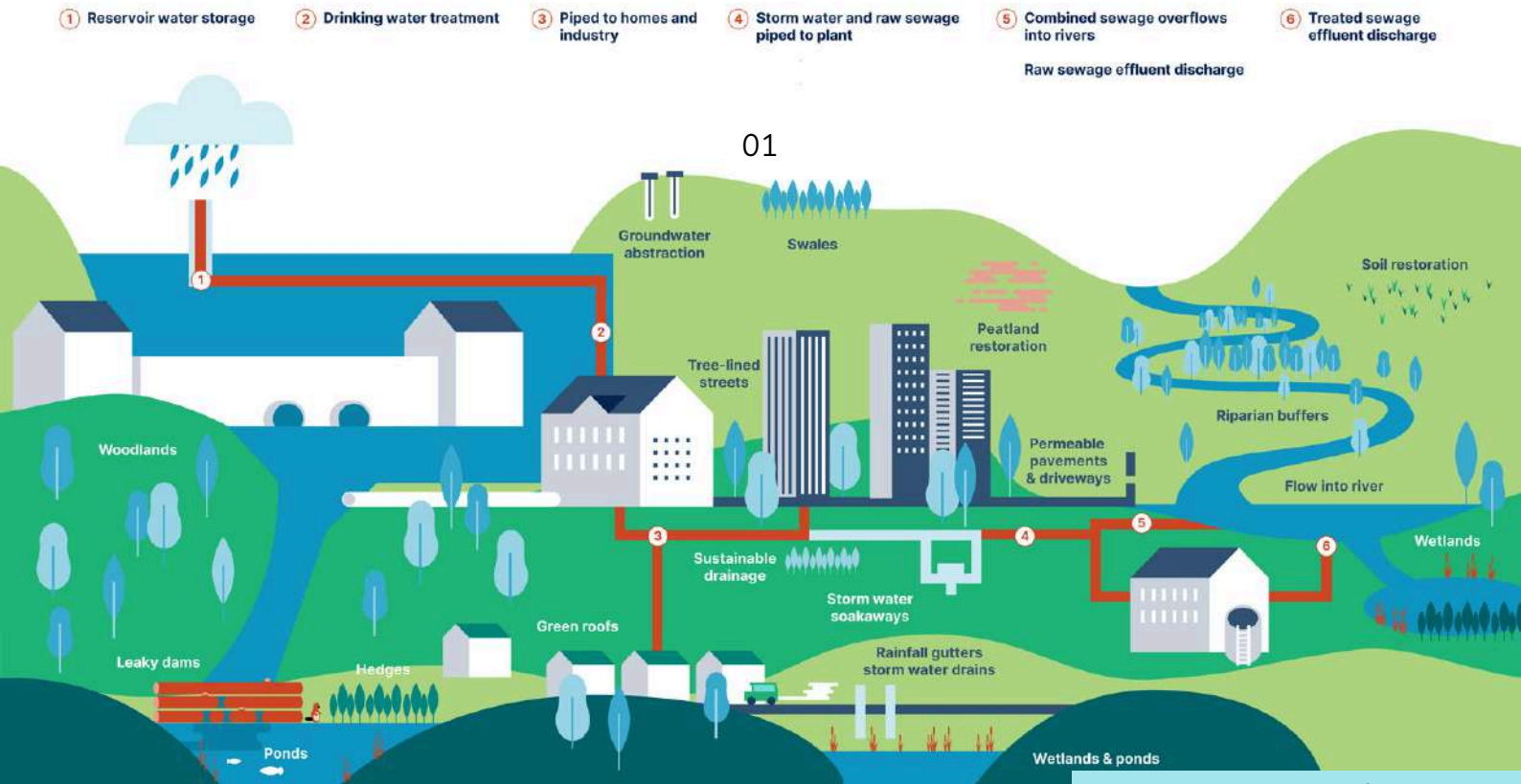


Credit Trent Rivers Trust, picturing new wetland area created as part of the project



Credit Trent Rivers Trust, picturing historic TRT project on the river Mease where a confluence has been reconnected to its floodplain

Nature-based solutions build resilience to water and flood management



Credit: The Rivers Trust, The State of Our Rivers report

NFM is a catchment-wide, collaborative approach

The wider benefits of NFM

Like other NbS, NFM can achieve a lot more than just reducing flood risk. With the emphasis being on using natural processes to slow and delay the flow, well-designed and constructed NFM schemes can deliver a number of other benefits.

- Habitat creation
- Reduced erosion
- Attractive habitats and green spaces
- Improved water quality
- Carbon capture
- Heat and drought resilience

Reducing flood risk

NFM can not reduce flood risk alone. It is one of a number of important tools needed to decrease flood risk to communities.

Other measures include conventional storage and drainage infrastructure, maintenance as well as the use of careful town planning, SUDS, green and blue infrastructure and NbS measures upstream.

Effective long term flood risk reduction requires input and coordination from a range of organisations, including the Lead Local Flood Authority (LLFA), the Local Planning Authority and the Environment Agency (EA), alongside communities and landowners. Partners work collectively to improve flood resilience, and bring forward solutions that will reduce flood risk.

Policy is in place to promote flood risk reduction. However, national funding is oversubscribed and the mechanism to bring forward new schemes takes time and is complex.



Credit: Trent Rivers Trust picturing pond extension in high flow conditions

Potential economic benefits of NFM

To better understand the economic benefits of natural flood management, TRT commissioned JBA Consulting to quantify the damages avoided using different types of NFM measures, both alone and in combination.

The study modelled the benefits of wider soil management, run-off attenuation features and riparian management across the entire Soar as well as some priority sub catchments.

■ Savings could be up to £19,850,000* per major event, assuming a max of 50% take-up of NFM (RAF and WSM) across the entire catchment, based on the three best-calibrated storms. If such an event occurs once every ten years, this works out a saving of £1,985,000 per annum.

■ This amounts to 5-6% of the total flood damage to property that could be avoided across the catchment based on an average from the events considered.

*This figure does not include the cost of delivering NFM.

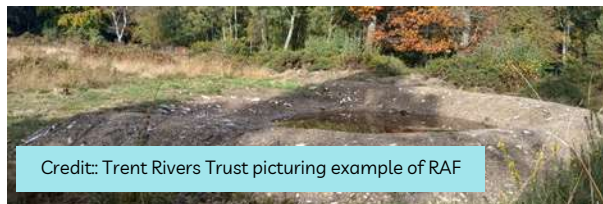
■ RAFs are most effective in small catchments and are predicted to reduce peak flows between 10.6-17.9% for smaller catchments

■ WSM plays a vital role and is predicted to reduce peak flow by 9.8-9.9% for larger downstream catchments



Credit: Trent Rivers Trust picturing example of WSM

Wider soil management (WSM); incorporating good practice land management to promote infiltration and reduce erosion, such as aeration, subsoiling, low tillage, cover crops, crop rotation, reduced stock density and increased vegetation cover.



Credit: Trent Rivers Trust picturing example of RAF

Runoff attenuation features (RAF); include ponds, wetlands, floodplain storage, bunds, gully blocking and sediment traps.



Credit: Greg Armfield, WWF UK picturing volunteers delivering NFM near Loughborough

CASE STUDY

Increasing flood resilience in Loughborough

Why Loughborough?

Flooding is a worry for many citizens in Loughborough. Up to 4,200 properties are at risk of surface water flooding in Loughborough, listing it nationally as 69th out of over 4,000 at risk settlements.

In terms of NFM, there is room for improvement. Much of the farmland close to the west of the town is poor in biodiversity, with fragmented habitats. Decades of intense land management and effective drainage within the town and across farmland upstream have resulted in fast-flowing watercourses and contribute to flooding after heavy rain.

Approaching landowners

This project focussed on the Moat Brook, a tributary flowing into Loughborough from the west. Land ownership within the catchment is spread across 20 separate individuals or organisations. TRT approached landowners for permission to survey and discuss possible options. NbS was a new concept for most of the landowners in the catchment.

TRT used a range of specialist staff to reach out landowners using agricultural advisors, an agronomist, a farmer cluster group, NFM and land use planning experts. The response varied; some were open to the concept of NbS, others less so, and some did not respond at all.



Credit: , Trent Rivers Trust, picturing wetland in the Moat brook area after construction (left) and in wet conditions (right).

CASE STUDY



Credit: , Trent Rivers Trust, picturing leaky barriers in the Moat brook area in high flow

Delivery of NbS in the headwaters

As part of its initial outreach, TRT approached the public landowners at two country parks that lie at the top of the Moat Brook catchment; Beacon Hill managed by Leicestershire County Council (LCC) and 'The Outwoods', managed by Charnwood Borough Council (CBC) and a golf course.

The landowners were receptive and keen to agree to NbS. The land proved suitable, with plenty of options for new wetlands, leaky barriers and ponds within the grassland and woodland.

After 12 months of planning and design, work started in spring 2024. The schemes included several new ponds, swales, leaky barriers, creating new and varied habitats, all blended into the landscape. It was delivered by a combination of contractors and a series of successful volunteer work party days.

Key outputs

- 2,850m³ of additional flood storage when completed
- Over 250 features to slow or intercept flows.

A local, long-term solution

As a legacy of the project, TRT along with partner members of the Loughborough Flood Board aim to build on the concepts, knowledge gained and relationships developed. TRT is working to secure funding to work with landowners, communities to continue and develop the concepts, including NFM and BNG, for sites both within and upstream of the Loughborough, ensuring a long-term and strategic commitment to nature and catchment restoration.

Throughout this project, TRT has developed concepts for NFM with majority of other private landowners within the Moat Brook catchment. However, none of the landowners as yet have been in a position to agree to a scheme.

Insights from landowner outreach

As part of the project, TRT recorded the common reasons why landowners decided not to commit to NFM. The most common reason were:

- Lack of financial incentive for NbS – no scheme exists as yet that is sufficiently attractive to convince private farmers to change land management practises to reduce flooding downstream and risk a loss to their production rates or bottom line.
- Delays and concerns with ELMS scheme (SFI and Countryside Stewardship). In 2025, details on the ELMS options are starting to emerge, a balance is needed between viability for the farm business and environmental benefits delivered. Revenues for SFI options vary from £151/ha for low input permanent grassland to £596/ha for a buffer strip). Higher tier options are more generous, but schemes will require substantial planning and development.
- Land allocated or offered for housing development – at least three of the landowners in the Moat Brook are actively pursuing the sale of land for housing. This is a lucrative business; one hectare of land can sell for £40,000 to a developer for housing.



Credit: Picture 1: Oxley Primary School, pupils engaging with 3D sandbox Picture 2: TRT demonstrating best practice in Sustainable urban Drainage at ReAction Festival in Leicester

Engaging Communities

Throughout the project, TRT attended community events, supported local flood action groups, visited several schools, held community talks, ran a 6-week volunteer programme in the Country Parks near Loughborough and helped set up a local Citizen Science Investigation group at the two key sites.

Community insights

- Flood aware communities are supportive and understand how NbS can help to reduce flood risk as well as provide other benefits.
- Many are worried about flooding, they are confused about where to go to for advice, and what support is available during a flood.
- Communities that have not suffered flooding are less likely to engage with flood aware information.
- Many are worried about new housing sites and an increased risk of flooding after development.
- Community frustration over delays to schemes and lack of funding to help reduce flood risk.



Volunteering at The Outwoods and Beacon Hill with Trent Rivers Trust gave me the opportunity to learn about NFM, practically building the brush bundles, to meet other volunteers from a variety of backgrounds, some along with the Trent Rivers Trust team, with an in-depth knowledge of flooding risk management has increased my understanding, which is helpful having flooded on three occasions in the last 12 years."

Michael Byes, Volunteer





Increasing community flood resilience

Are you
Flood Aware?

Research targeting communities in the Soar early on in the project revealed:

- 70% did feel 'not all prepared' for a future flood event in their local area
- 75% felt some concern about an increase in flood risk, because of climate change.
- Over half of respondents did not know how to find out whether their property was at flood risk
- 70% wanted to get involved in a community initiative addressing flood risk to some degree.

Flood aware

Working with local partners, TRT developed a joint online resource, directing communities to information on action and tools to better understand flood risk in the Soar catchment and beyond. This included identifying properties at risk of flooding, signing up for flood alerts and more involved solutions, such as signposting to a guide to flood action groups, or advice on becoming a local flood warden, supported by the LLFA.

The campaign was activated via a local media launch, with TRT speaking to BBC Radio Leicester, a paid social media campaign and a pop-up event at a flood hot spot in Loughborough.

Flood aware web resource

Do you know what you'd do in the event of a flood?

Along with our partners' report and advice, [we recently ran a poll](#) which found nearly 70% of people had never thought about what they would do in a flood. But the time to think about flooding is before it happens - so that you are prepared and can minimise the impact of any flooding on your home and family.



More Information

Are you in Leicestershire? We are currently working on a project to increase flood resilience in Leicestershire. You can find more useful information about flooding and how you can be prepared on the [Leicestershire County Council website](#).

If you live outside of Leicestershire or in Leicester city, you can find helpful information on your local council website. [Find your local council here](#).

- [The National Flood Forum](#)
- [The Flood Hub](#)
- [Flood Mary](#)
- [Floodite](#)
- [Be Flood Ready](#)
- [Get involved with nature-based solutions](#)



Credit: Trent Rivers Trust picturing citizen science training in Whissendine

CASE STUDY

Introducing natural flood management to Whissendine

TRT focussed on working with communities and got closely involved with residents in Whissendine as catchment suitable for NFM.

There is a long history of flooding in the village, with the road being blocked and the pub suffering frequent floods. The village was uncertain about NFM and had previously attempted to address the issue by forming a flood action group. Differing views on effective solutions, combined with conflicting advice on viable methods meant that the group disbanded.

TRT became involved with with the community in Whissendine to learn about their views.

- Presented its plans to the parish council, demonstrating NbS using the interactive sandbox and an interactive catchment model.
- Hosted a pop-up meeting at the village square to recruit citizen scientists, listen to concerns and introduce NbS.
- Ran a webinar and a focus group, to raise awareness of NbS along with a discussion about watercourse maintenance and dredging.

Key figures

- 30 leaky barriers installed
- 14 predicted storage areas (eg. ponds, wetlands)
- 7,750 m² of floodplain reconnected
- 2,500 m³ volume of water storage created
- 8 critical landowners engaged with
- 94 community members engaged

With water quality concerns, ranking high, TRT helped create a Citizen Scientist Investigation group which, for a year, recorded monthly water samples and observations of river morphology

The engagement efforts were welcomed by the local community and its findings helped inform discussions on growing concerns about flooding and water quality.

“Since TRT became involved there seems to have been a shift in opinions within the village; both in conversation and on social media. It seems that 'slowing the flow' is now seen as a positive approach in seeking to reduce the impact of flooding on the village.”

Whissendine Parish Council



Credit: Greg Armfield, WWF UK

Pathways to NbS

The mechanisms to bring forward NbS for flood risk reduction are still very patchy, no strategic system exists to identify which areas should be prioritised. To address the issue locally, it is vital that organisations and funders work together to enable more NbS schemes to be brought forward to reduce flood risk.

Upskill and upscale for NbS

- Provide training on NFM and flood risk assessment for design and consenting staff.
- Local Authority planning teams should be trained in and required to use the [Green Infrastructure planning and design guide](#) when planning new developments. Government should strongly encourage this in the design and construction industries.
- Ensure planners and regulators have sufficient resources, training and expertise to facilitate NbS projects.
- Increase funding provided to LLFAs, LPAs and EA for strategic planning for land use and flood risk management and ringfence a proportion of the budget for NbS.

Create an improved strategic framework

- Develop a land use framework that can strategically consider flood risk reduction and housing development requirements, taking into account water management catchments.
- Work with LPAs, LLFAs and strategic planners to ensure new development takes place at appropriate sites using flood resilience and best practise SUDS techniques at the property and whole development scale.
- Carry out a strategic desk study with opportunity mapping to identify and prioritise areas most beneficial for NbS with NFM.
- Set up a special purpose mechanism oversee NbS delivery for key areas; to attract and hold finance, deliver and maintain features, take on liability, etc. on behalf of multiple landowners.
- Support and increase funding for Catchment Partnerships.

Incentivise landowners

- Increase financial support for landowners to enable them to agree to NbS, through grants and other financial incentives.

For further detail, particularly on our national policy level recommendations find the technical report at trenriverstrust.org/what-we-do/working-with-nature/natural-flood-management/



Credit: Trent Rivers Trust

Conclusion

NFM has the potential to play a vital role in decreasing the economic damage of flooding and restoring nature at the same time. Mainstreaming NbS requires incentive, skill and funding support. Well-connected and resourced Local Planning Authorities and Local Lead Flood Authorities need to act strategically to inform local land use decisions for increased flood resilience. It is vital we continue to create solutions that engage communities, provide resources to increase awareness on ways to prepare for flooding and the role of NbS.

Thank you to our partners

We thank the WWF and Aviva, for their continued support throughout the project. The technical and financial support enabled us to work with the key stakeholders and communities across the Soar, advocate for a more strategic approach and deliver solutions on the ground.

