

A Blue Recovery



WWT

Four blue infrastructure proposals
for the UK's recovery

'Previous generations built infrastructure on which the public now depend. Now it is the Government's responsibility to build the public health and governmental infrastructure that will protect the country for decades to come.'

Our plan to rebuild

The UK Government's COVID-19 recovery strategy, May 2020



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Overview



The challenges we face



Before COVID-19, the world was facing a climate crisis, a nature crisis and an emerging wellbeing crisis.

The drivers of these crises are complex yet interrelated, and at their heart lies the inescapable fact that our health is inextricably bound with that of our planet.

These crises are partly driven by wetland loss; we are depleting their natural capital, the stocks of natural assets that underpin our economy and wellbeing.

Current demands upon natural capital are greater than supply. Despite its relatively high rate of return we are underinvesting in the natural capital¹ held in our wetlands. We depend upon these wetlands for essential goods and services, however they declined dramatically. England alone has lost around 90% of its freshwater wetlands in the past 500 years².

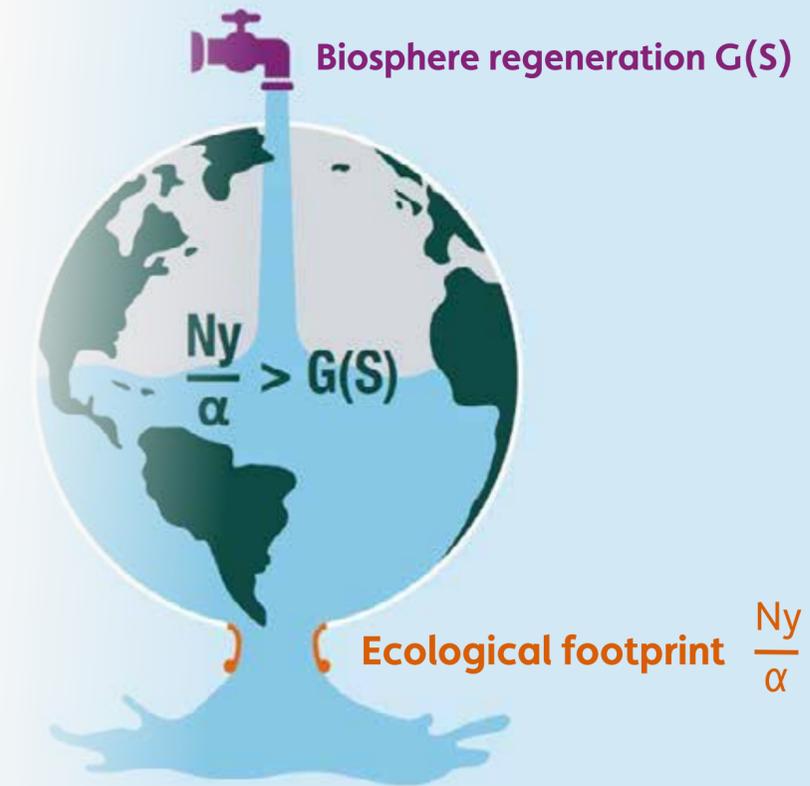
People want a 'green recovery'³ that delivers the measures required to protect public health, rebuild the economy and repair our environment.

The UK Government wishes to 'act wisely to lay in place new long-term foundations...as previous generations built infrastructure on which the public now depend'⁴. This approach must include making better use of natural infrastructure.

2020 has been a year without equal but next year we have an opportunity to build back better.

In 2021 we can adopt an approach that works with nature to address the challenges we face. Through leading a 'blue recovery' – which places wetlands at the heart of our approach – the UK can show the world how to build back better.

Unsustainable use of the biosphere¹



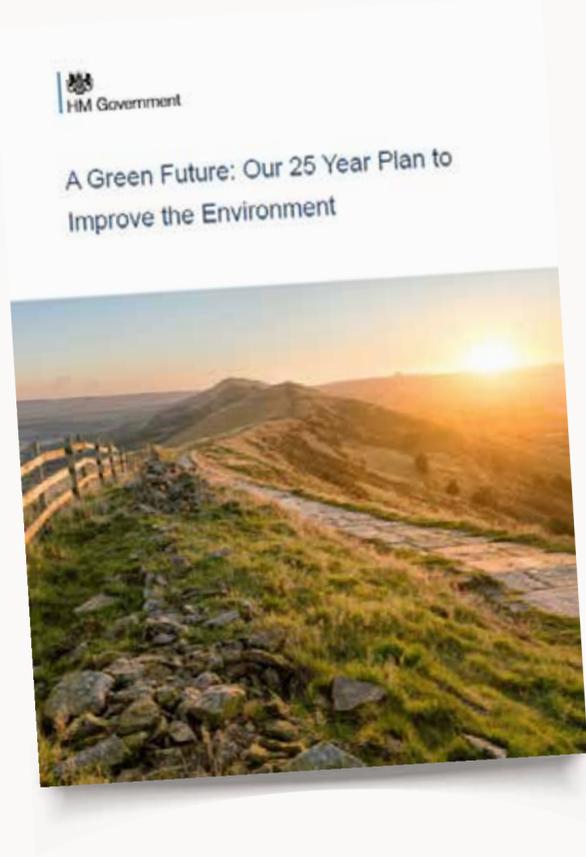
¹ Interim Report – The Dasgupta Review: Independent Review on the Economics of Biodiversity, April 2020.

² Managing the Wetlands of England – A Wetlands Archaeology GIS Resource, van De Noort, R, 2007.

³ Royal Society of the Arts / Food Foundation / YouGov, April 2020.

⁴ Our plan to rebuild: The UK Government's COVID-19 recovery strategy, UK Government, May 2020.

Recovery using blue infrastructure



In 2018 the Government set out the UK's 25 year plan for the environment.

Launched at WWT's London Wetland Centre, this aims to make ours *'the first generation to leave our environment in a better state than we found it and pass on to the next generation a natural environment protected and enhanced for the future'*⁵.

This plan sets out goals and policies, including the use of nature-based solutions to address broader societal challenges, as well as the development of a Nature Recovery Network⁶.

This network is envisaged to provide a *'wide range of additional benefits: greater public enjoyment, carbon capture, water quality improvements and flood management'*⁷.

Wetlands function as blue infrastructure that provides many essential benefits.

The contribution they make far outweighs those made by other ecosystems⁸, with multiple benefits ranging from reducing coastal erosion to regenerating urban neighbourhoods.

Wetland creation provides an excellent return on investment.

The Natural Capital Committee identify *'a good economic case for expanding the extent of wetland areas by around 100,000ha'* to deliver the goals of the 25 Year Environment Plan⁹. The Committee notes the benefits costs ratio of such wetland creation can be as high as 9:1¹⁰.

'There is a good economic case for expanding the extent of wetland areas by around 100,000ha'

Natural Capital Committee

⁵ A Green Future: Our 25 Year Plan to Improve the Environment, HM Government, 2018. ⁶ The Nature Recover Network will provide '500,000 hectares of additional wildlife habitat, more effectively linking existing protected sites and landscapes, as well as urban green and blue infrastructure and the use of nature-based solutions to address broader societal challenges', *ibid.* ⁷ *ibid.* ⁸ Global Wetland Outlook, Ramsar Convention Secretariat, (2018). ⁹ Natural Capital Committee Advice to Government on the 25 Year Environment Plan, Natural Capital Committee, September 2017. ¹⁰ The State of Natural Capital, Protecting and Improving Natural Capital for Prosperity and Wellbeing, Third report to the Economic Affairs Committee, Natural Capital Committee, 2015.

Our proposal



WWT proposes creating 100,000 hectares of wetlands to help address the climate, nature and wellbeing crises, and to help the UK recover from the Covid-19 pandemic.

Potential

Many communities have benefited from wetland creation, however there is **potential to do much more**. Now is the time to move from ad-hoc interventions to creating a strategic network of wetlands.

Purpose

Each wetland created can provide many benefits. Among other benefits, these new wetlands can be used as:

A carbon storage network, using wetlands to sequester and store carbon

A flood management network, using wetland features to reduce flooding

An urban wellbeing network, using wetlands to improve wellbeing

A water treatment network, using wetlands to support biodiversity

Process

WWT are experts in wetland creation. We work in the UK and overseas – on the ground and via global professional networks – to lead efforts. We are doing this through:

Delivery

Restoring and creating wetlands

Capacity building

Supporting organisations and individuals to create wetlands

Community engagement

Helping local people value and look after their wetlands

Partnership

100,000 hectares of wetlands is a big figure – we cannot achieve this alone. We want to work in partnership with everyone across Government, business and wider civil society.

Whether you wish to protect your livelihood, improve your neighbourhood or enhance your quality of life, we want to work with you to secure a blue recovery.



A carbon storage network



'The science is clear. Wetlands are the most effective carbon sinks on our planet.'

Martha Rojas Urrego

Secretary General of the Ramsar Convention on Wetlands, January 2019



The climate challenge



Carbon emissions

Climate change is our gravest threat. We have only a decade left to limit global warming to a maximum safe limit of 1.5°C. Globally, the extra damage caused in 2100 by a 2°C rise (as opposed to 1.5°C) would amount to \$US 15-38.5 trillion (2.3-3.5% of Gross World Product)¹¹.

UK response

The UK is legally committed to reducing greenhouse gas emissions to net zero by 2050 however, we are not on track to meet this. The UK is projected to miss its 4th and 5th carbon budgets (2023 to 2032)¹². Laggard sectors include land use, where greenhouse gas emissions have flatlined since 2008. Without concerted action this sector could become one of the largest sources of emissions by 2050¹³.

2021

In 2021 we can help address climate change through the use of nature-based solutions. The UK Government intends to focus on this as the host nation for the COP26 climate summit¹⁴. There are further opportunities to explore this via the development of the new £3bn Environmental Land Management Scheme (ELMS) (where organisations ranging from the Green Alliance to the NFU¹⁵ recommend support for wetland restoration) and plans for managing coastal defences.



¹¹ Global Warming of 1.5 °C, UN Intergovernmental Panel on Climate Change, 2018.

¹² Acting on Net Zero Now, Green Alliance, 2019.

¹³ Land use: reducing emissions and preparing for climate change, Committee on Climate Change, 2018.

¹⁴ "There are some areas which need particular attention in 2020 [including] nature, safeguarding ecosystems, protecting natural habitats and keeping carbon out of the atmosphere" – Alok Sharma MP, COP26 Chair and Business Secretary, February 2020.

¹⁵ Achieving Net Zero, Farming's 2040 goal, National Farmers Union, 2019.

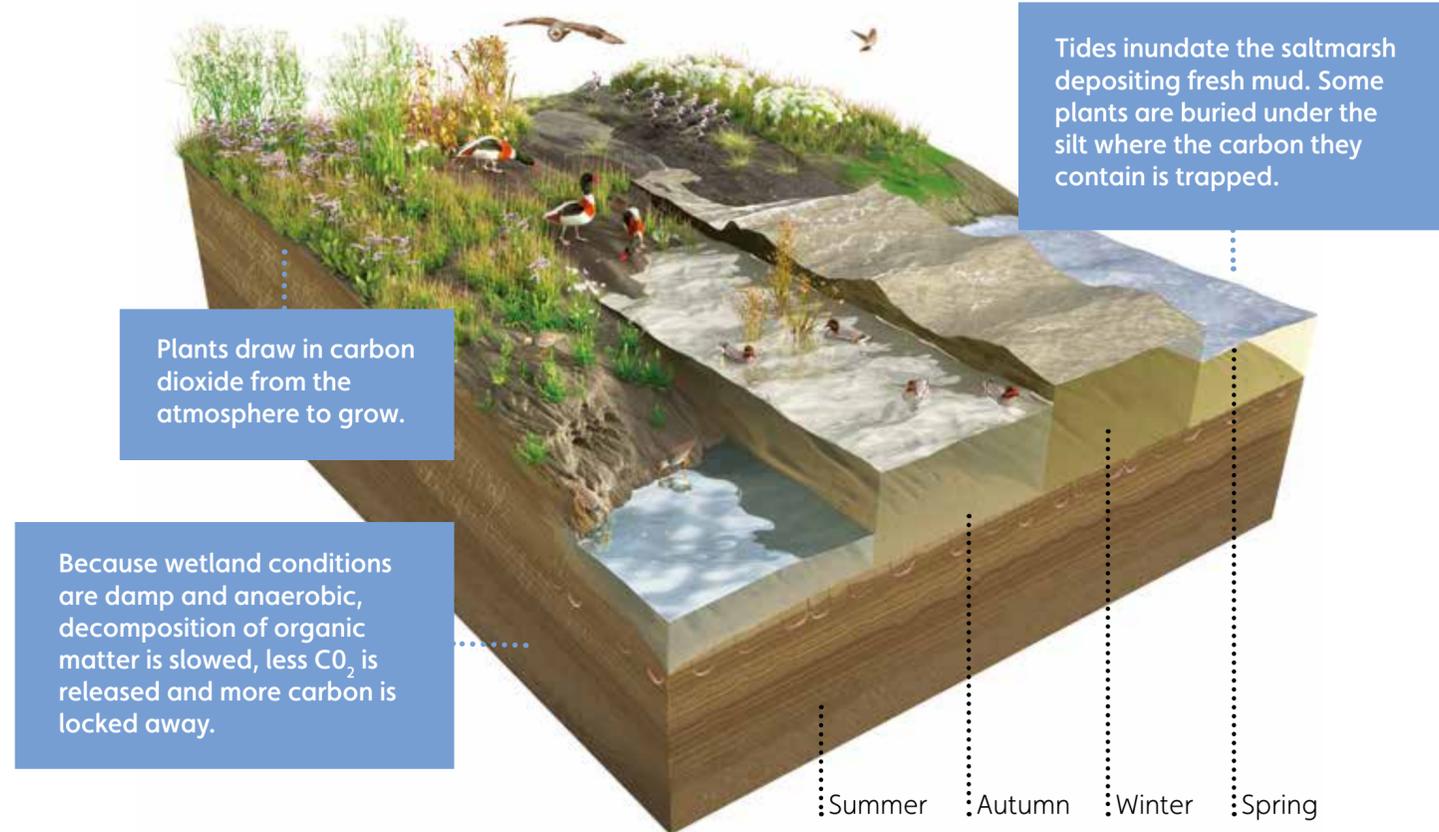
Wetlands and carbon



Why wetlands?

Wetlands play an important role in limiting the amount of carbon in the atmosphere. This is recognised in the 2015 Paris Agreement. Vegetated coastal habitats are important carbon stores;

although their global area is one to two orders of magnitude smaller than that of terrestrial forests, their contribution per unit area to long-term carbon sequestration is much greater¹⁶.



How it works

Carbon from the estuary or from vegetation is buried after every tide, leaving behind a new layer of organic carbon-rich sediment.

This regular tidal inundation keeps the soil wet, inhibiting microbial action and slowing down plant decomposition. When more carbon is removed from the environment and stored than is released, the carbon accumulates. Newly created saltmarsh habitats bury large amounts of carbon each autumn as saltmarsh plants die back. This provides carbon-rich organic matter that annually gets buried and trapped by the tidal sediment.

Wetland potential

There is potential to create wetlands such as saltmarsh to help meet carbon targets. This process would involve managed realignment, altering coastal flood defences to create a larger intertidal area.

A report commissioned by the Natural Capital Committee identified scope for creating 22,000 ha of saltmarsh in England (a 54% increase on current extent) as a potential natural capital investment¹⁷. This would have a benefit cost ratio of between 2 and 3:1¹⁸.

Co-benefits

Wetland creation of this type provides benefits beyond carbon storage.

Co-benefits include coastal defence, fisheries production, recreational opportunities and supporting biodiversity. It should also be noted that the land on which coastal habitat is created is already vulnerable to sea level rise, often becoming uneconomic to protect in the medium to long term.

¹⁶ A blue print for blue carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO₂, E. McLeod et al, Front Ecol Environ 2011.

¹⁷ The Economic Case for Investment in Natural Capital in England – Final Report for the Natural Capital Committee, Eftec, 2015.

¹⁸ The State of Natural Capital, Protecting and Improving Natural Capital for Prosperity and Wellbeing, Third Report to the Economic Affairs Committee, Natural Capital Committee, 2015.

Blue Carbon WWT Steart Marshes

Steart Marshes is a 480ha nature reserve on the edge of the Severn Estuary near Bridgwater, Somerset.



Created in 2014 in partnership with the Environment Agency, it is a vast wetland landscape, containing a mosaic of intertidal, fresh and brackish water habitats.

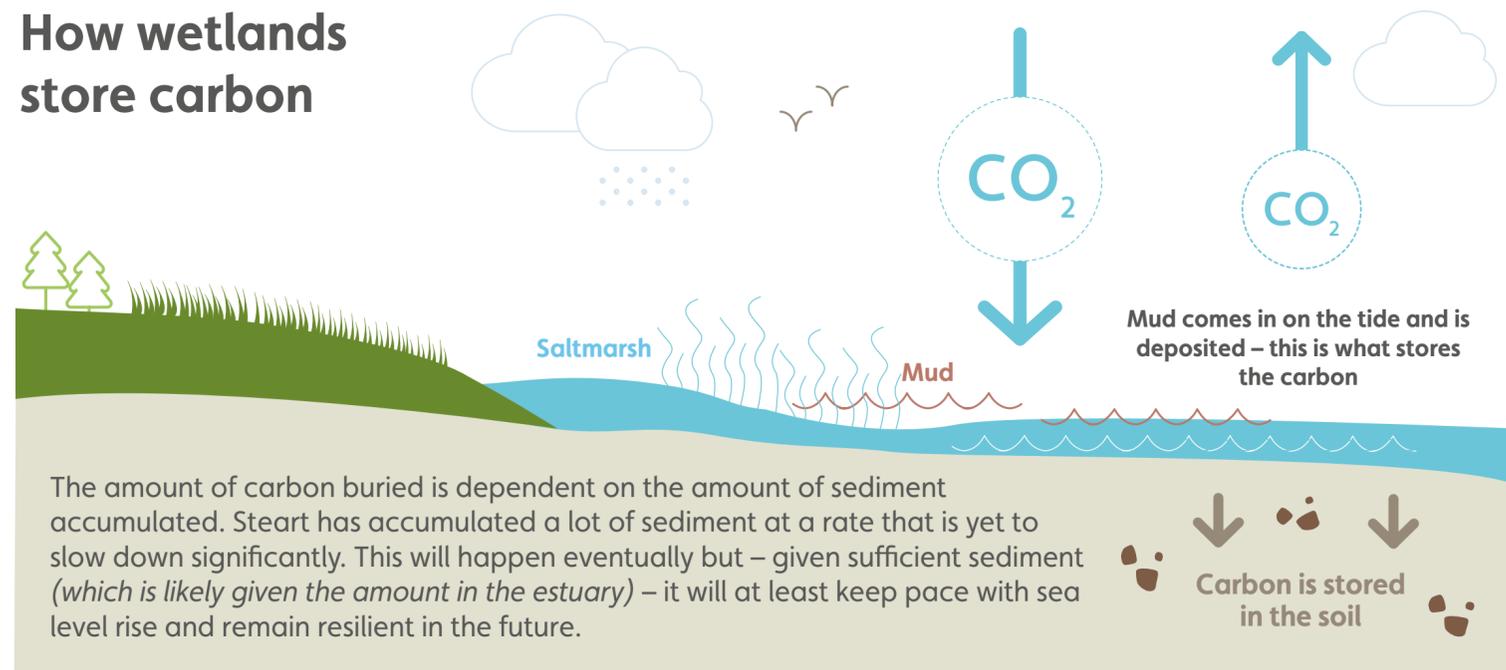
This site was created to compensate for the loss of intertidal habitat in the Severn Estuary due to rising sea levels.

Steart's saltmarshes currently store

10,000_s tonnes of carbon

every year, as well as providing space for nature, reducing flood risk, benefiting wellbeing and supporting local economies.

How wetlands store carbon



The amount of carbon buried is dependent on the amount of sediment accumulated. Steart has accumulated a lot of sediment at a rate that is yet to slow down significantly. This will happen eventually but – given sufficient sediment (which is likely given the amount in the estuary) – it will at least keep pace with sea level rise and remain resilient in the future.

How much carbon is being stored?

WWT are working with scientists from Manchester Metropolitan University to measure the rate and scale of carbon sequestration and storage.

Since 2014, the newly laid down sediment comprises approximately:

4.5% organic carbon
(from plants and sediment)

– twice as much as that accumulated by previous agricultural land management.

Using core samples and topographical surveys we have calculated the sedimentation that has occurred and the amount of carbon stored. The levels of both processes are extremely high.

Steart Marshes is burying carbon at a rate of approximately:

25-32 tonnes per hectare
(per year)

resulting in a total of 26,000-34,000 tonnes between August 2014 - October 2018.

This is likely to be an underestimate, as our measurements so far do not include the amount of carbon sequestered within the vegetation of the developing saltmarsh habitat. As the site has matured it has become diversely vegetated, which is likely to increase the amount of carbon stored.

Creating a carbon storage network



WWT wants to create a bigger and better network of coastal wetlands to store carbon.

To unlock their full potential we wish to work in partnership to deliver the three core elements of a carbon storage network.

Delivery



Creating 22,000 hectares of saltmarsh

- **Habitat creation:** Delivering coastal wetland creation and restoration projects
- **Mapping:** Identifying opportunities for coastal wetland restoration and creation (e.g. establishing Technical Advisory Group on Managed Realignment)
- **Policy & advocacy:** Securing policy and funding framework. Includes incorporation into UK Greenhouse Gas Inventory, Shoreline Management Plans and Nationally Determined Contributions as well as development of a Blue Carbon Standard and market



Capacity building



Empowering others to create coastal wetlands

- **Advice and training:** Supporting land managers and advisors, local communities, rural businesses and local planning authorities
- **Evidence:** Measuring and presenting the impacts wetlands have on carbon storage and other benefits



Community engagement



Helping local people to value and care for coastal wetlands

- **Consultation:** Working with local people to help them shape communities and coastlines
- **Education and awareness:** Providing opportunities to explore and celebrate local heritage
- **Volunteering:** Offering a range of opportunities, including practical conservation work and local champion scheme





A flood protection network



'Storms Ciara and Dennis – and communities that have suffered repeated flooding events in recent years – have highlighted to me the importance of making nature's power part of the solutions we urgently need to tackle the challenge of flooding.'

Rt Hon George Eustice MP
Environment Secretary, February 2020



The flooding challenge



Flood risk

Climate change is significantly increasing the severity of extreme rainfall events^{19,20} and flood risk is now one of the UK's top climate change risks²¹. Storms Ciara and Dennis made February 2020 the wettest ever²² with a record breaking number of flood warnings²³. In England 1 in 6 homes – around 5.2 million households²⁴ – and over 500 major infrastructure assets are vulnerable to flooding²⁵. The winter 2015-2016 floods in England were estimated to have cost the economy £1.3- £1.9 billion²⁶; by the 2050s the annual average losses from coastal and river flooding in England and Wales could rise by up to £6.8 billion²⁷.

UK response

The UK has doubled its flood defence budget to £5.2bn however we can no longer rely exclusively on 'hard engineering'. Few at-risk places remain where large, traditional defences (e.g. barriers) are a viable, cost effective option.

Natural Flood Management (NFM) is now part of the Government's new Floods Strategy. As Environment Agency Chief Executive Sir James Bevan recognises: *'While hard defences will continue to play a vital role in helping to keep people and places safe, even more important for reducing flood risk in future is managing the flow of water through the environment. The best way to do that is through natural methods ...creating wetland habitats that hold water and enhance biodiversity'*

Sir James Bevan, Chief Executive, Environment Agency 2020

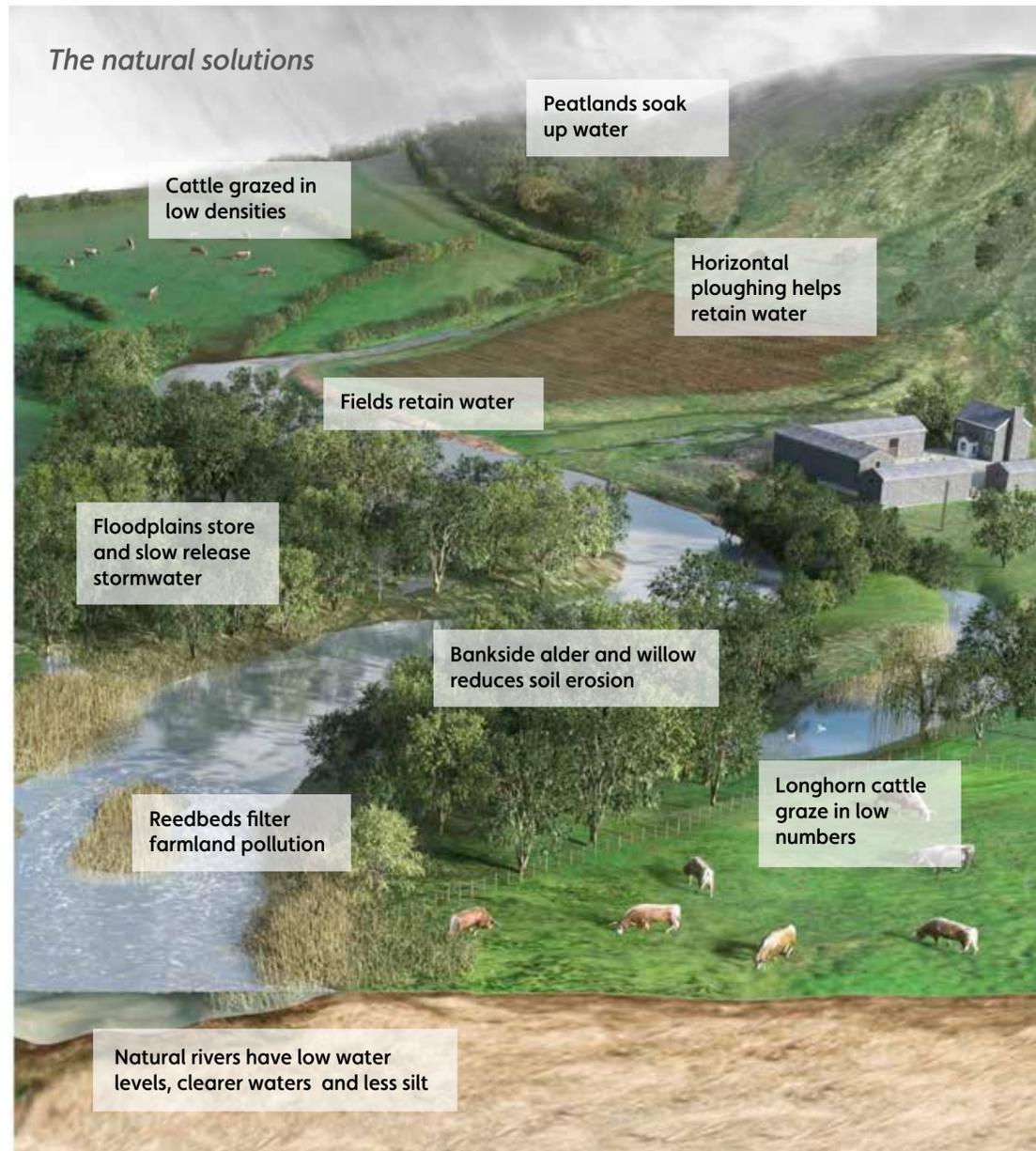
2021

In 2021 we can address flood risk through the use of nature-based solutions. Opportunities include the deployment of the Government's new Floods Strategy, the development of the new Environmental Land Management Scheme (ELMS) and the revision of the current National Infrastructure Strategy.



^{19/20} UK Climate Change Risk Assessment, UK Government, 2017 / National Flood Resilience Review, HM Government, 2016. ²¹ Committee on Climate Change, 2016; UK Climate Change Risk Assessment 2017, UK Government, 2017. ²² Storm Jorge: Flood-hit towns battle wettest February on record, BBC News, 2020. ²³ Storm Dennis floods: how bad are they and what is being done?, The Guardian, 2020. ²⁴ Flooding in England: A National Assessment of Flood Risk, Environment Agency, 2009. ²⁵ National Flood Resilience Review, HM Government, 2016. ²⁶ Estimating the economic costs of the 2015 to 2016 winter floods, Environment Agency, 2018. ²⁷ UK Climate Change Risk Assessment, UK Government, 2012.

Wetlands and flood management



Why wetlands?

Wetlands play an essential role in regulating the movement of water through landscapes.

These wetlands span a wide variety of habitats, from ponds and water meadows that store water to meandering rivers that slow the flow of water through the countryside.

How it works

Natural flood management encompasses a variety of low-cost techniques that use opportunities in the landscape to reduce flooding.

These measures seek to increase water storage (e.g. floodplain reconnection) and infiltration (e.g. storage capacity of soil) and/or slow and disperse water flows. The latter can be achieved by increasing the 'roughness' of the ground surface (e.g. planting vegetation) and through the use of in-river features (e.g. leaky woody debris dams) to reduce peak flow ('attenuation').

Wetland potential

There is potential to create wetlands using natural flood management techniques to reduce flood risk, particularly in smaller communities that might not normally receive built flood defences. This process would involve the deployment of small-scale measures throughout river catchments to create a network of natural flood defences. Investing in flood schemes more generally is proven to have high ratios in terms of costs avoided, with the Environment Agency finding that every £1 invested in flood schemes saves £10 in damages avoided²⁸.

Co-benefits

Wetland creation of this type provides benefits beyond flood protection.

Co-benefits include improved biodiversity, enhanced water quality²⁹ and strengthened community cohesion³⁰.

²⁸ <https://www.gov.uk/government/news/environment-agency-says-that-a-different-approach-is-needed-to-tackle-flooding-over-next-50-years>.

²⁹ Valuing water quality improvements from peatland restoration: Evidence and challenges. Ecosystem Services, Vol 9, Martin-Ortega, J. et al, 2014; The impacts of natural flood management approaches on in-channel sediment quality, Janes, V. J. et al, 2017.

³⁰ 'Learning for resilience': Developing community capital through flood action groups in urban flood risk settings with lower social capital. International journal of disaster risk reduction, Vol 27, McEwen, L. et al., 2018; Capturing the multiple benefits associated with nature-based solutions: Lessons from a natural flood management project in the Cotswolds, UK, Short, C. et al, 2019.

Flood Management **Two Valleys**

Since 2018 WWT have been piloting a Natural Flood Management programme in the Two Valleys area, around the Doniford and Monksilver streams in west Somerset.



One of 15 Government-backed pilots, we are working with farmers, landowners, businesses and the wider community to reduce flooding affecting the town of Williton and surrounding communities.

Together with our partners, WWT has restored natural features across the catchment that have been lost or replaced over time by man-made structures. These include creating 10 new open water wetlands, installing 91 'leaky dams', and planting over 1,200 trees.

We are measuring the multiple benefits of this approach, training community members to gather evidence, with over 100 surveys undertaken.

Although the project has only been running for a year, local flood risk has already reduced. Early evidence indicates the new NFM features – particularly woody dams – have boosted local biodiversity, with a rapid increase in insect diversity and abundance.

Creating **10** new wetlands

Installing **91** leaky dams

Planting over **1200** trees



Creating a flood protection network



WWT wants to create a bigger and better network of wetlands to reduce flooding.

To unlock their full potential we wish to work in partnership to deliver the three core elements of a flood protection network.

Delivery



Creating wetlands

- **Habitat creation:** Delivering NFM projects in flood-affected river catchments and communities close to WWT wetland centres in England; operating as delivery partner on large natural flood management schemes across England and acting as framework site management partner on major nature-based flood schemes
- **Policy & advocacy:** Securing policy and funding framework. Includes deployment of Government's Flooding Strategy and development of Environmental Land Management Schemes (ELMS)

Capacity building



Empowering others to create wetlands

- **Advice and training:** Supporting land managers, local communities, businesses and local planning authorities. Includes providing technical expertise on wetland feature design and also developing and delivering a NFM advisor accreditation and standards scheme
- **Evidence:** Measuring and presenting impacts on flooding and other benefits, sharing knowledge and publishing guidance through a dedicated online information hub

Community engagement



Helping local people to value and care for wetlands

- **Consultation:** Deploying community outreach staff during development, delivery and management of nature-based flood schemes
- **Education and awareness:** Providing opportunities to explore and celebrate local heritage. Includes developing a package of education and awareness tools and materials for local communities, disseminated via projects, online and WWT Centres and Hubs
- **Community ownership:** Using exemplar NFM projects to develop and promote a model for local community ownership based on community groups and local (e.g. parish-level) authorities, using citizen science as a key component



WWT

An urban wellbeing network



'We know that a blue environment can be as good or even better for you than a green one: living near or visiting the coast, rivers and lakes increases people's reported levels of mental health and wellbeing.'

Sir James Bevan,
Chief Executive, Environment Agency, September 2020



The wellbeing challenge



Mental health

Poor mental health is a major public health challenge, accounting for 40% of GP appointments³¹ and affecting 1 in 4 people each year³². In England, 1 in 6 people report experiencing a common mental health problem (e.g. anxiety, depression) in any given week³³. This costs the NHS over £34bn a year with the wider economic, social and health costs amounting to £105bn per year³⁴.

UK response

The UK Government recognises the value of connecting people with nature to improve wellbeing³⁵, however, this is constrained by the quality of the built environment. Spending time in and around blue spaces can be even more beneficial for than green spaces³⁶ yet the quality and ease of access varies considerably. Access is particularly limited for minority groups and low-income families: 1 in 8 households in

Britain (1 in 5 in London) does not have access to their own garden³⁷ and in England black people are nearly four times as likely as white people to have no access to outdoor space at home³⁸.

2021

In 2021 we can improve wellbeing through the use of nature-based solutions. The UK Government aims for *'more people, from all backgrounds, to engage with and spend time in green and blue spaces in their everyday lives'³⁹*. It seeks to achieve this by *'making sure that there are high quality, accessible, natural spaces close to where people live and work, particularly in urban areas, and encouraging more people to spend time in them to benefit their health and wellbeing'⁴⁰*. Measures include social prescribing, educational initiatives and the provision of green infrastructure.

Other opportunities are presented by new approaches to improving public health⁴¹ and the reform of the planning system⁴².

Globally, the UK could follow the best practice of 18 'Wetland Cities', recognised by the Ramsar Convention⁴³: as pioneers in the conservation and wise use of urban and peri-urban wetlands and the socioeconomic benefits they bring for local people.



³¹ <https://www.mind.org.uk/news-campaigns/news/40-per-cent-of-all-gp-appointments-about-mental-health/>. ³² Adult psychiatric morbidity in England, 2007: results of a household survey. The NHS Information Centre for health and social care. McManus, S et al, 2009. ³³ Mental health and wellbeing in England: Adult psychiatric morbidity survey 2014, McManus S et al, 2016. ³⁴ The five year forward view for mental health: A report from the independent Mental Health Taskforce to the NHS in England, 2016. ^{35/39/40} A Green Future: Our 25 Year Plan to Improve the Environment, HM Government, 2018. ³⁶ Does living by the coast improve health and wellbeing?, B. Wheeler et al, 2012; Happiness is greater in natural environments, MacKerron and Mourato, Global Environmental Change, 2013. ^{37/38} Office for National Statistics, May 2020. ⁴¹ Advancing our health: prevention in the 2020s, Department of Health and Social Care. ⁴² Planning for the Future, MHCLG, 2020. ⁴³ Ramsar Convention on Wetlands of International Importance. As one of six International Organisation Partners (IOPs), WWT takes a leading role in championing the Convention and works with Defra to promote this via communication, capacity building, education, participation and awareness (CEPA) activity. Further information on Wetland Cities: <https://www.ramsar.org/news/18-cities-recognized-for-safeguarding-urban-wetlands>.

Wetlands and wellbeing



Why wetlands?

Wetlands are a key part of the urban environment. These 'blue spaces' can be existing assets (e.g. canals, rivers, streams, ponds, lakes and their borders) or new ones (e.g. ponds or rain gardens) that can be created from the water that falls on hard surfaces using the principles of sustainable drainage systems (SuDS).

How it works

Such blue spaces can be used to support wellbeing. Good quality, accessible and attractive urban blue space can be provided, where people live and work, and can be targeted at areas in greatest need. When delivered at scale these urban wetlands can be used to support social prescribing, where healthcare professionals refer people to local, nonclinical services to improve wellbeing.

WWT's 'blue prescriptions' pilot at Slimbridge Wetland Centre engaged individuals with wetland nature,

with significant improvements across a range of indicators, including mental wellbeing, anxiety, stress and emotional wellbeing⁴⁴.

Wetland potential

There is potential to create many more urban wetlands – in a variety of different formats and at different scales – to improve wellbeing. These can range from restoring neglected rivers to retrofitting SuDS into existing developments to incorporating new blue spaces into new developments.

Co-benefits

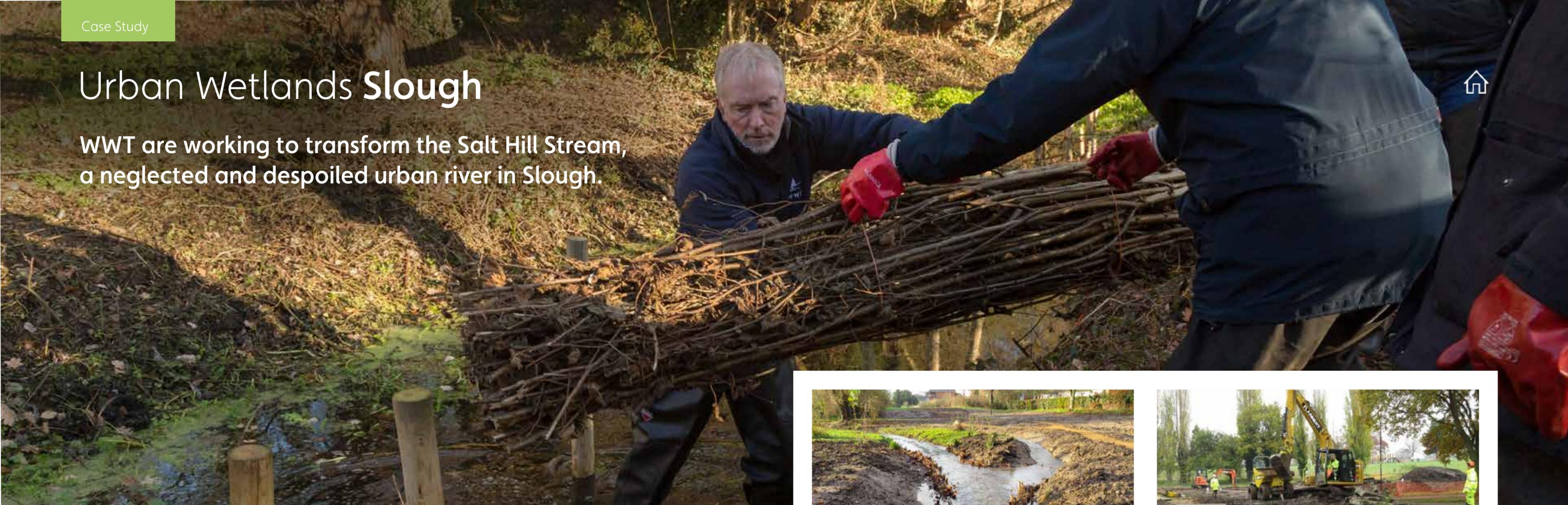
Urban wetlands provide benefits beyond wellbeing and can be designed to address multiple issues. These include facilitating active travel, improving water quality, reducing surface water flooding, strengthening community cohesion, reducing urban heating and increasing biodiversity.



⁴⁴ For further information visit <https://www.wwt.org.uk/our-work/projects/wetlands-human-health-and-wellbeing/>.

Urban Wetlands Slough

WWT are working to transform the Salt Hill Stream, a neglected and despoiled urban river in Slough.



Although surrounded by wealthier areas with extensive and high-quality greenspace, the communities immediately around the stream contain significant pockets of deprivation and are disconnected from the stream.

WWT is working with Slough Borough Council, Thames Water, the Environment Agency and the local community to transform the stream and reconnect it with local communities. Works are underway to create demonstration features, establish the river corridor as a transit route and daylight culverted sections.

This revived urban wetland will benefit from reduced flood risk and improved water quality. It will also facilitate the NHS's recommended five steps to wellbeing⁴⁵.

This wetland will help people to connect with others and develop a lasting affinity with the stream and its catchment, be physically active, learn new skills to improve their local environment, give to others through volunteering, pay attention to the present moment and appreciate the environment around them.



⁴⁵ [nhs.uk/conditions/stress-anxiety-depression/improve-mental-wellbeing/](https://www.nhs.uk/conditions/stress-anxiety-depression/improve-mental-wellbeing/).
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Creating an urban wellbeing network



WWT wants to create a bigger and better network of urban wetlands to improve wellbeing.

To unlock their full potential we wish to work in partnership to deliver the three core elements of an urban wellbeing network.

Delivery



Creating urban wetlands where people live and work

- **Habitat creation:** Installing water features (e.g. ponds) on individual properties and SuDS at street level; regenerating (e.g. waterways) and installing (e.g. rain gardens) in neighbourhoods; creating free-to-access community wetland 'hubs' in cities / boroughs on disused land and the NHS estate
- **Policy & advocacy:** Securing a policy and funding framework. Includes planning reform and urban design guidance



Capacity building



Empowering others to create urban wetlands

- **Advice and training:** Providing advice and guidance to businesses, homeowners and local planning authorities; running training programmes, delivered online or via WWT wetland hubs; offering partnership and learning opportunities (e.g. WWT Blue Buddies scheme for local authorities)
- **Evidence:** Measuring and presenting the impacts of urban wetlands



Community engagement



Helping local people to value and care for urban wetlands

- **Consultation:** Working with local people to help shape their neighbourhoods
- **Education and awareness:** Providing cultural engagement programmes exploring local heritage and using wetlands as a source of inspiration and creativity; delivering schools outreach programmes, including lessons, presentations and practical advice (e.g. pond installation)
- **Volunteering:** Running volunteer programmes, including practical conservation work, ongoing maintenance and community adoption schemes



A Water Treatment Network





'The EA's latest water body classification results showed that 16% of waters overall and 14% of rivers are at 'good' ecological status... more needs to be done and we need to go further and faster'.

Rebecca Pow MP

Environment Minister, September 2020



WWT

The biodiversity challenge



Water pollution

The world faces a biodiversity crisis. Freshwater species and the wetlands they depend upon are being lost at an alarming rate. Poor water quality is helping to fuel this, driven by factors including land management practices, industrial uses, population growth and climate change⁴⁶.

UK response

The UK is committed to improving water quality however it is highly likely it will miss current targets. These include a legal requirement to bring all waters to 'Good Status' by 2021⁴⁷. Currently, only 16% of English water bodies are classified as being in good ecological status and every single one fails to meet good overall status⁴⁸.

2021

In 2021 we can improve water quality through the use of nature-based solutions. The Government aims to *'improve at least three quarters of our waters to be close to their natural state as soon as is practicable'*⁴⁹ and is setting new legally binding targets via the Environment Bill. Water companies are expected to help meet this via obligations set out in the £5 billion Water Industry Natural Environment Programme (WINEP) as well as through developing their own innovative approaches to reduce pollution.



⁴⁶ The state of the environment: water quality, Environment Agency, February 2018.

⁴⁷ The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

⁴⁸ WFD Classification Status Cycle 2, Environment Agency, 29 September 2020.

⁴⁹ A Green Future: Our 25 Year Plan to Improve the Environment, HM Government, 2018.

Wetlands and biodiversity



Why wetlands?

Wetlands perform a critical role in protecting and improving water quality by filtering out pollutants. This includes removing nutrients (e.g. nitrogen and phosphorus), pesticides and sediment from agricultural runoff and filtering pollutants from industrial and road runoff in urban areas.

How it works

Treatment wetlands and Sustainable Drainage Systems (SuDS) can be created to remove pollutants. For over 30 years WWT have been managing and monitoring wetlands at our centres that are specifically designed to improve water quality. In addition, we have developed different wetland schemes for other organisations for a wide range of purposes, from treating sewage, stormwater and agricultural waste to handling landfill leachate, mine drainage and road runoff.

Wetland potential

There is potential to create wetlands to help improve water quality, with the benefits far outweighing the costs. This process would involve constructing treatment wetlands and SuDS to create a water treatment network. Environment Agency analysis⁵⁰ shows that achieving the Government's 'good status' 75% target⁵¹ generates benefits of around £22.5bn for costs of £17.5bn. The Natural Capital Committee (NCC) notes that reducing this to less costly interventions improves this to £20bn benefits for £12bn costs⁵².

Co-benefits

Treatment wetlands and SuDS provide benefits beyond water quality and can be designed to address multiple issues. These range from food production (supporting pollinating insects) to climate mitigation (reducing the urban heat effect).



⁵⁰ Impact Assessment: Update to the river basin management plans for England's water environment, Environment Agency 2015. ⁵¹ '75% target reflects current River Basin Management Plans (RBMPs) analysis of where benefits outweigh costs; waters includes rivers, lakes, groundwater aquifers, estuaries and coastal waters', Footnote 3, A Green Future: Our 25 Year Plan to Improve the Environment, HM Government, 2018.

⁵² The State of Natural Capital: Protecting and Improving Natural Capital for Prosperity and Wellbeing, Third Report to the Economic Affairs Committee, Natural Capital Committee, 2015.

Wetland Treatment System South Finger

WWT created this system at our Slimbridge headquarters in 1995 to treat water before it leaves the site.



Water floods over
20 hectares of
wet grassland
supporting breeding
lapwing and redshank.

Comprised of a settlement pond, three treatment beds planted with different species mixes, a rafted lagoon, a cascade lagoon and two polishing beds, the treated water flows into a pool with a bird hide where visitors can watch nesting kingfishers.

Performance is regularly monitored through chemical water testing. The system has been shown to remove 10% of total phosphorous, 60% of ammonia and 40% of nitrates.



Creating a water treatment network



WWT wants to create a bigger and better network of wetlands to improve water quality.

To unlock their full potential we wish to work in partnership to deliver the three core elements of a water quality network.

Delivery



Creating wetlands in rural and urban areas

- **Habitat creation:** Delivering exemplar catchment-scale wetland creation and restoration projects; partnering with industry to develop wetlands at scale across their business operations
- **Policy & advocacy:** Securing policy and funding framework. Includes development of Environmental Land Management Schemes (ELMS), water company plans, nutrient neutrality schemes and a Treatment Wetlands Standard



Capacity building



Empowering others to create wetlands in rural and urban areas

- **Advice and training:** Providing advice and guidance to statutory agencies, water companies, rural businesses and farming advisors, local planning authorities, housing developers, and other relevant industry sectors; running training programmes, delivered online or via WWT wetland hubs
- **Evidence:** Measuring and presenting the impacts of treatment wetlands and SuDS



Community engagement



Helping local people to value and care for wetlands

- **Consultation:** Working with local people to help them shape their neighbourhoods
- **Education and awareness:** Delivering schools outreach programmes, including lessons, presentations and practical advice (e.g. pond installation)
- **Volunteering:** Running volunteer programmes, including practical conservation work and citizen science





If you would like to know more about our four proposals please contact

Tom Fewins, Head of Policy & Advocacy, WWT

tom.fewins@wwt.org.uk

07900 607596

