



Department  
for Environment  
Food & Rural Affairs

# Our integrated plan for delivering clean and plentiful water

We are the Department for Environment, Food and Rural Affairs. We are responsible for improving and protecting the environment, growing the green economy, sustaining thriving rural communities and supporting our world-class food, farming and fishing industries.

We work closely with our 33 agencies and arm's-length bodies on our ambition to make our air purer, our water cleaner, our land greener and our food more sustainable. Our mission is to restore and enhance the environment for the next generation, and to leave the environment in a better state than we found it.



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# Ministerial Foreword

Water is what makes life possible on our planet. It is essential for human health and wellbeing, for wildlife, and for our economy - including the production of food. We are blessed by our range of rivers, lakes, wetlands and coastlines. We host migratory ducks, geese, and waders, as well as 85% of the world's rare chalk streams.

Water is so precious. Both of us treasure it and it has a special place in hearts across the Defra ministerial team - from Somerset to Suffolk, Nottinghamshire to Cumbria. That is why we are proud to launch our new Plan for Water, which will catalyse and coordinate a step change in action across government, our economy, and the whole country to make our water clean and plentiful.

We use about 14 billion litres of water per day and will need 4 billion more by 2050. Thanks to our government acting to require monitoring of storm overflows, we have unveiled the serious problems we face on sewage and created a plan to fix it requiring the largest investment ever by water companies. At the same time, we recognise that we are dealing with a Victorian-era sewerage network that in length would wrap around the world two and a half times, while transformative projects like the Thames Tideway Tunnel take time to deliver.

We have legislated through the Environment Act 2021 for stronger powers for our regulators, for tackling pollution and for greater transparency with the public so we can hold water companies and polluters to account. We have set specific legally binding targets and set out how to reduce water pollution in our new Environmental Improvement Plan.

We are making progress. Much loved species, like seahorses and seals, are returning to our rivers and estuaries. Salmon have returned to the river Don for the first time in 200 years. Last year, over 72% of our bathing waters in England were classified as 'excellent', up from just 51% in 2010. Many of the micro and single-use plastics that wreak such havoc on our marine environment are now banned.

We know that people across the country want to see more progress in tackling pollution. We agree. That is why reducing the use of storm overflows is a top priority for the government, as well as a personal priority for both of us.



Our Plan for Water is designed to take us further and faster, based on taking a systematic, local, catchment-based approach, in a coordinated and collaborative way, using both nature-based solutions and investment in infrastructure involving communities, water companies, and businesses.

Streamlining and strengthening regulation with better integration of water management will drive delivery. To tackle pollution, we have massively stepped up our requirements for investment. Ofwat now has powers to link performance to payouts to shareholders and management of water companies. And if companies fail, our regulators will get more powers to impose much larger penalties for polluters without needing to go to court.

Those penalties will go straight into our new Water Restoration Fund, so we can support more projects that improve the environment - and keep the pressure off your bills. We have also brought forward £1.6 billion of extra infrastructure investment to help tackle these issues across the country, particularly on storm overflows from Cornwall to Cumbria.

We will also design new homes to be more efficient with our use of water. We will tackle every source of pollution from run-off from roads and fields, to banning harmful chemicals and unnecessary use of plastic, including a new ban on plastic-containing wet wipes. We will work with farmers to enjoy a plentiful supply of water for growing our food, while also ensuring wildlife is protected.

We are working from source to sea, backing the frontrunners who are leading the way as well as making sure everyone is bringing up their baseline and tackling pollution head on.

Our Plan for Water is a national endeavour. We can each take straightforward steps to be careful on how we use water - whether you turn off the tap when brushing your teeth, not flushing products containing plastic, or getting a smart meter installed in your home so you can save on your bills and spot leaks quickly.

We hope that this Plan will help us all think about how we can pull together to secure clean and plentiful water, for people, for businesses and for nature, now and for generations to come.

## **The Rt Hon Thérèse Coffey MP**

**Secretary of State for Environment, Food and Rural Affairs**

## **Rebecca Pow MP**

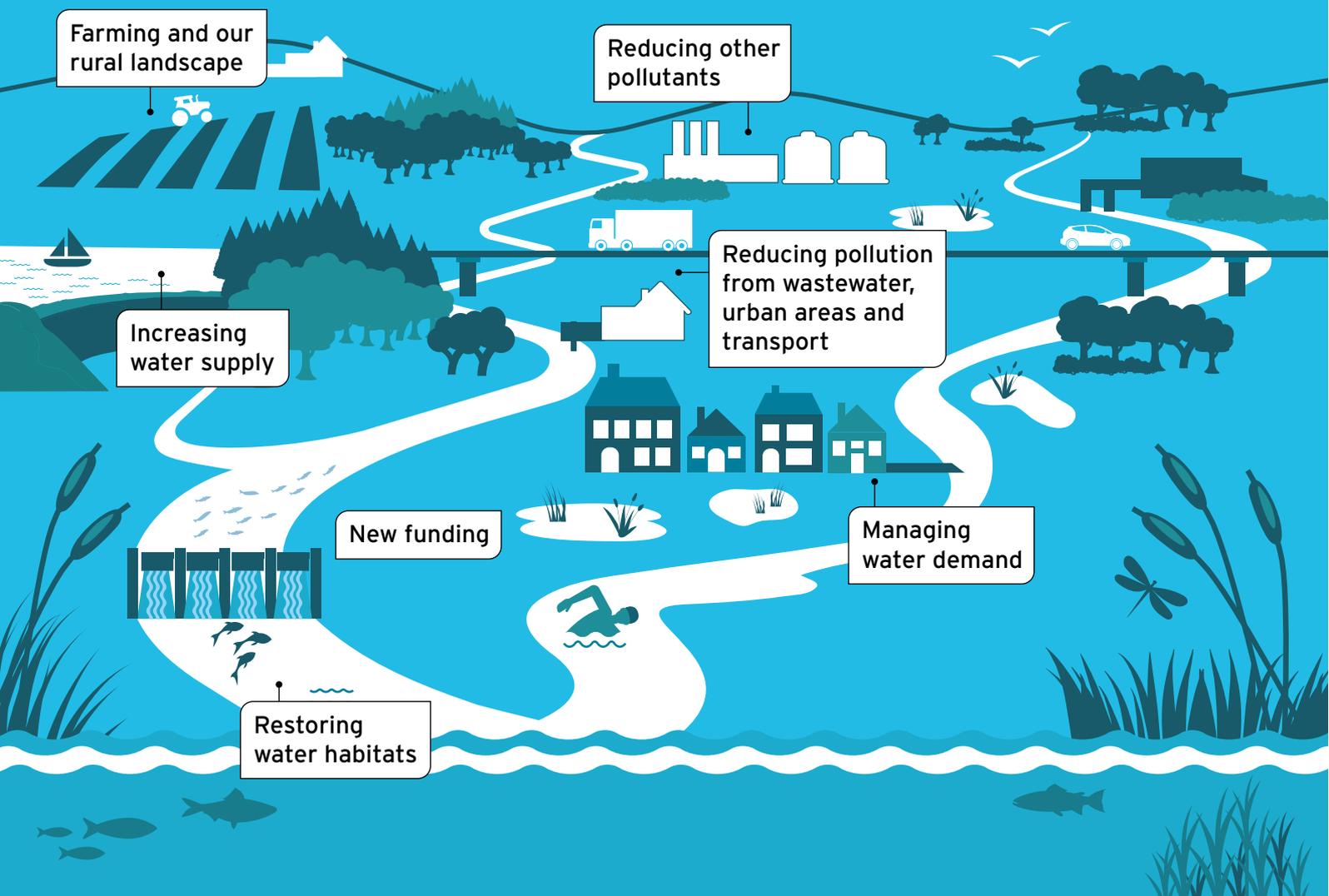
**Parliamentary Under Secretary of State  
(Minister for Environmental Quality and Resilience)**

**4 April 2023**



# Delivering Clean and Plentiful Water

Actions to transform the management of the whole water system



# Executive summary

This Plan for Water will deliver clean and plentiful water - a healthy water environment, and a sustainable supply of water for people, businesses, and nature.

We have made huge progress on water. Our bathing waters continue to improve - last year 93% were classified as 'good' or 'excellent', up from 76% in 2010. Supply interruptions to customers have decreased five-fold and leakage has been cut by a third since privatisation. Pollution in our rivers has significantly reduced - there is now 80% less phosphorus and 85% less ammonia compared to 1990 when water companies were privatised. Cadmium and mercury in the water environment have also reduced.

In January 2023, we set out our goals and targets with [the Environmental Improvement Plan \(EIP23\)](#). We are now delivering this Plan for Water which brings together the significant steps we have already taken with new action. This Plan will transform our management of the water system, deliver cleaner water for nature and people, and secure a plentiful water supply. The actions are for government and regulators to lead on, but everyone needs to be involved to deliver this - water companies, businesses, regulators, and the public.

In this plan, we set out measures to transform and integrate our water system, address sources of pollution, and boost our water supplies through more investment, tighter regulation, and more effective enforcement.

## Transform management of the whole water system

The best way to manage supply and pollution pressures is by taking an integrated approach across a whole catchment. Key actions include:

- delivering catchment action plans backed up with new funding to improve all water bodies in England
- more funding for catchment groups and catchment-scale partnerships that coordinate to drive action and investment where rivers need it most

Our catchment-based approach will be underpinned by improvements to how we manage our water system with a streamlined policy and legal framework and with smarter regulation to deliver clean and plentiful water. Key actions include:

- better integrating water and flood planning, and targeting actions where they will deliver the greatest impact for water quality, flood management, and nature recovery
- giving the Environment Agency the power to issue bigger penalties to water companies when they pollute

- enabling Ofwat, through the new powers of the Environment Act 2021, to link water company dividend pay-outs to environmental performance
- supporting Ofwat's changes to ensure that shareholders, not customers, will pay for water company executive bonuses where these companies are unable to demonstrate their pay award decisions reflect performance expectations

## **Deliver a clean water environment for nature and people**

A healthy water environment is essential to achieve our commitment to restore nature and halt the decline of species. We have set new legally binding targets to significantly reduce pollution from farming, wastewater, and abandoned metal mines, and have initiated the largest ever environmental infrastructure investment from the water sector. We have also substantially increased monitoring of storm overflows from only 10% in 2015, to over 90% now. We will take further action to address the multiple sources of pollution impacting our water bodies. Key actions include:

- a new Water Restoration Fund to channel environmental fines and penalties into projects that improve the water environment, including removing redundant water modifications, for example disused weirs, to restore natural processes
- accelerating around £1.6 billion of new water company infrastructure delivery to start in the next 2 years - reducing the number of spills from storm overflows, nutrient pollution, and increasing water supply
- commissioning water companies to provide the first 5000+ action plans on individual storm overflows
- leveraging £1 million investment in partnership projects each year to improve chalk catchments, in addition to supporting the delivery of the National Chalk Stream Restoration Strategy
- designing agricultural schemes so that farmland alongside rivers creates space for nature
- making our farming laws clearer and more effective at improving the environment - subject to consultation
- considering actions to reduce the impacts of the strategic road network on water quality as part of developing the next Road Investment Strategy 2025-2030
- rolling out standardised sustainable drainage systems in new developments - subject to final decisions on scope, threshold, and process, following consultation in 2023
- bringing forward measures to end the sale of wet wipes containing plastic - subject to consultation - and writing to the advertising authorities and producers about using the word 'flushable' in wet wipes

- proposing new restrictions on the use of ‘forever’ chemicals, perfluoroalkyl and polyfluoroalkyl substances (PFAS), which impact our rivers and seas

## **Secure a plentiful supply of water**

Growing demand for water, and more extensive periods of drought due to climate change are projected to create a supply-demand gap in the future if we do not cut waste, improve water efficiency, and invest in new water resource infrastructure. We have unlocked almost £500 million of additional investment in new large-scale water infrastructure and are making water companies produce plans to meet water demands in a changing climate.

Our plan further accelerates the delivery of new water supply sources, including from reservoirs, water recycling and transfers. We will also reduce drought impacts on water-reliant businesses and help farmers access the supplies they need. Key actions include:

- speeding up the delivery of water resources infrastructure and ensuring new projects like reservoirs deliver a net gain for biodiversity
- supporting farmers to store more water on their land - launching the second round of the £10 million Water Management Grant to fund more on-farm reservoirs and better irrigation equipment – and reducing planning barriers to small reservoirs

To meet the future demand for water and minimise the impact on bill payers, our Plan also includes measures to improve water efficiency. Key actions include:

- setting ambitious targets for water companies to crack down on leakage, facing financial penalties if they don't meet them
- improving water efficiency in homes by developing minimum product standards for showers, taps, and toilets



Stepping stones across a river in the Lake District National Park

# Introduction

The Plan for Water will deliver **clean and plentiful water - a healthy water environment, and a sustainable supply of water for people, businesses and nature.**

Our Plan is built around a catchment approach to managing the water system. We will use our regulatory powers and strategic policy approach to improve water quality and deliver a resilient water supply. While there has been progress in improving water quality, we recognise that standards and performance must keep improving to anticipate and prepare for further challenges ahead.

## Challenges of managing the water system

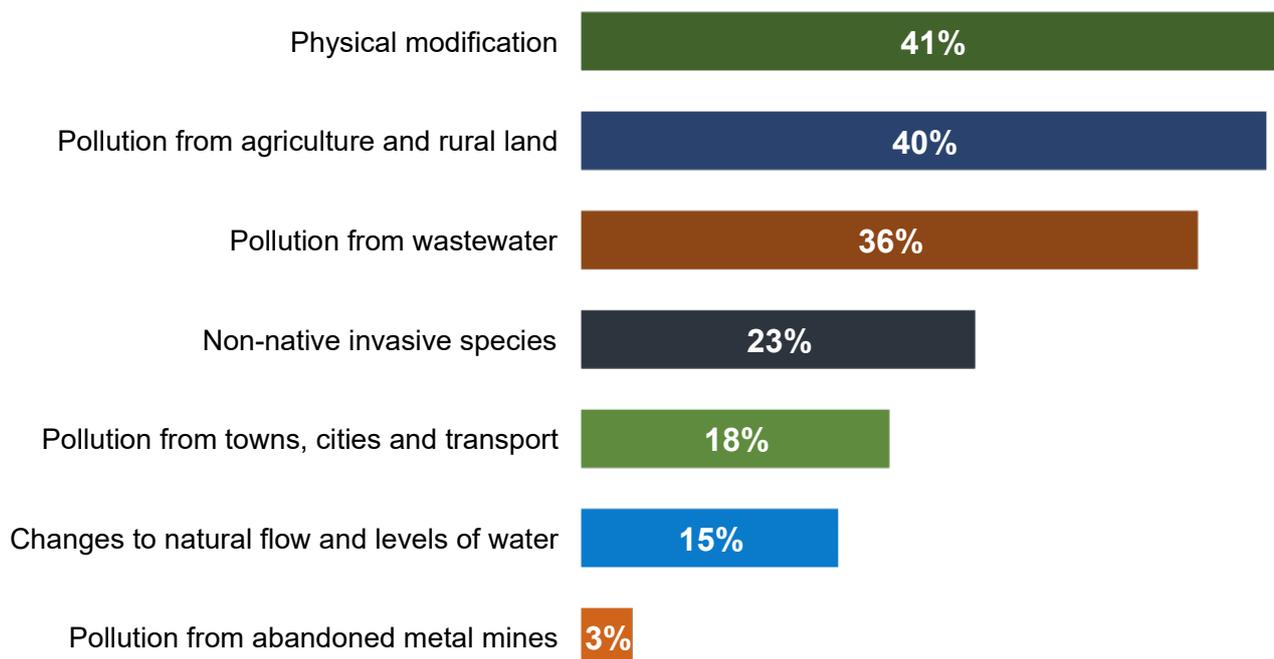
Pollution, bigger towns and cities, and population growth are putting a strain on our water supplies and water environment. Climate change is making these pressures worse. We are facing longer and more frequent droughts which are increasing interruptions to our water supplies. Wetter winters and more frequent, heavier storms are leading to more flooding and more pollutants being washed off fields and urban areas.

We are becoming increasingly aware of how emerging pollutants, such as microplastics and chemicals, are impacting our water system. These pollutants result from our everyday activities, from driving and cleaning our clothes, to what we flush down toilets.

Improvements have become increasingly challenging and costly to deliver as we deal with the more complex problems. The natural environment takes time to recover, so there is a lag between our actions and benefits being seen.

Like many other industrialised countries, we have physically modified our water environment over hundreds of years. We have straightened rivers, built steep concrete banks, and constructed small dams. Many of these modifications provide essential benefits to the economy and society, including drinking water, flood protection, and navigation, and we do not want to remove them. These can be seen in places like Pulteney Weir in Bath, the River Thames along the Embankment, or our canal system across the country.

The top pressures impacting our water bodies are in figure 1 below.



**Figure 1:** Top pressures impacting water bodies in England. Water bodies are commonly impacted by more than one pressure, so the totals do not add up to 100%.

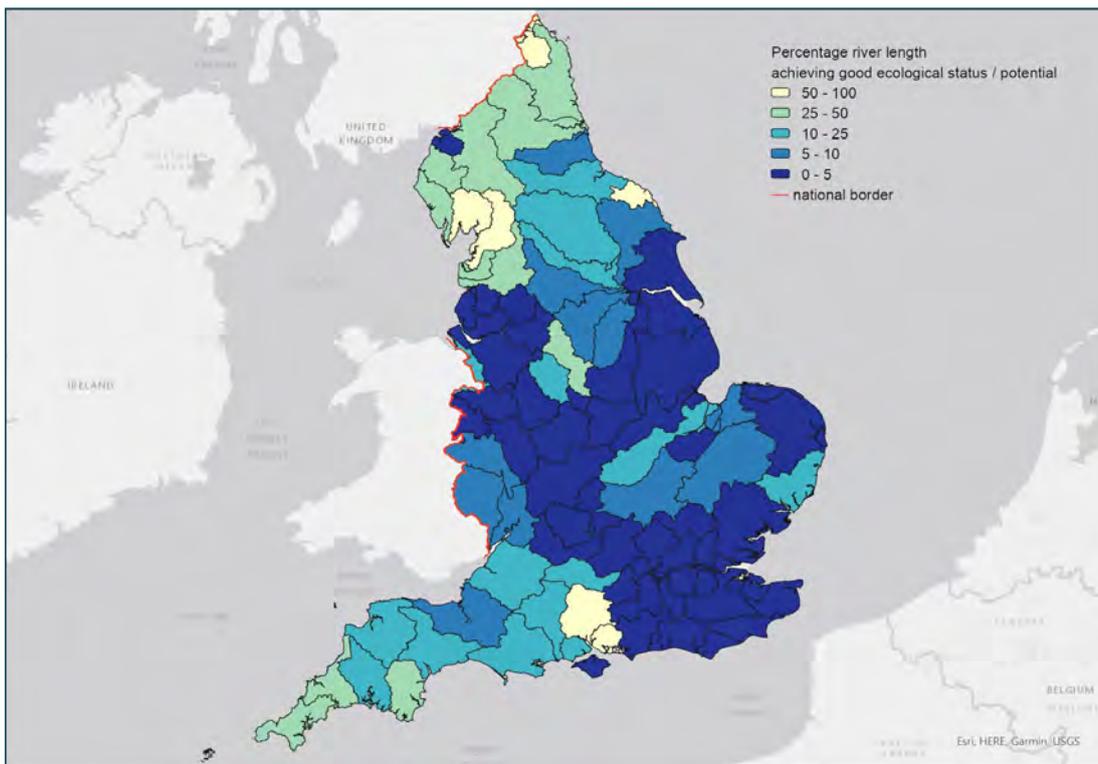
## The state of the water environment

We assess the health of the water environment using ecological status, chemical status, and the condition of protected sites. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 - 'the Water Environment Regulations 2017' - comprise up to 126 elements to be assessed. The tests are applied to rivers, lakes, estuaries, and coastal waters up to one nautical mile from shore, across 4,658 surface water bodies and 271 groundwater bodies.

- **Ecological status** is assigned using various water, habitat, and biological quality tests. Failure of any one test means that the whole water body fails to achieve good or high ecological status. Water bodies are classified as high, good, moderate, poor, or bad. Good ecological status is based on the aim to get as close to natural condition as possible given reasonable anthropogenic use. Water bodies that are artificial or heavily modified are classified according to their ecological potential instead (see action 2.13).
- **Chemical status** is assigned by assessing 52 different chemical elements, both individual and groups of chemicals. Water bodies are classified as good or failing. In 2019, England adopted advanced monitoring for persistent chemicals.

- **Groundwater status** is assigned by assessing salinity, water levels, and presence of chemicals. Groundwater quantity – how much water there is – and quality – how clean the groundwater is – are used to determine groundwater body status.
- **Bathing, shellfish, and drinking water protected areas status** is assigned by assessing the presence of pollutants, such as nitrates and E. coli. Bathing waters are categorised as excellent, good, sufficient, or poor. Shellfish and drinking water areas are assessed as pass or fail.
- **Protected nature site condition** is used to determine the health of protected nature sites, for example Sites of Special Scientific Interest (SSSIs) and Habitat Sites (Special Areas of Conservation, Special Protection Areas, Ramsar Sites). These sites receive classifications ranging from favourable to destroyed (Annex A). Favourable condition often has a higher threshold than good ecological status.

In England, 16% of surface water bodies currently achieve good ecological status, and 64% of water bodies are at moderate ecological status. The percentage of water bodies achieving good ecological status across England is shown in figure 2.



**Figure 2:** The percentage water bodies in each management catchment in England that achieve good ecological status in 2019.

However, these headline figures do not show the complete picture of the state of our water environment. The 'one-out-all-out' approach requires each individual test – such as on fish or pH – to pass as 'good' for the water body to achieve overall good ecological status. Of the underlying tests for all 4,658 surface water bodies, 79% meet the requirement for good ecological status (Annex A). One fifth of all water bodies are classified as moderate ecological status, rather than good ecological status, because of only one 'moderate' test result – all other tests achieved good. For example, in the upper part of the River Kennet, all ecological elements are at high or good, with the exception of the fish element, which is at moderate due to small dams blocking their passage along the river. The tests on individual elements under ecological status are also done at different frequencies – for example, fish surveys are done every 5 years.

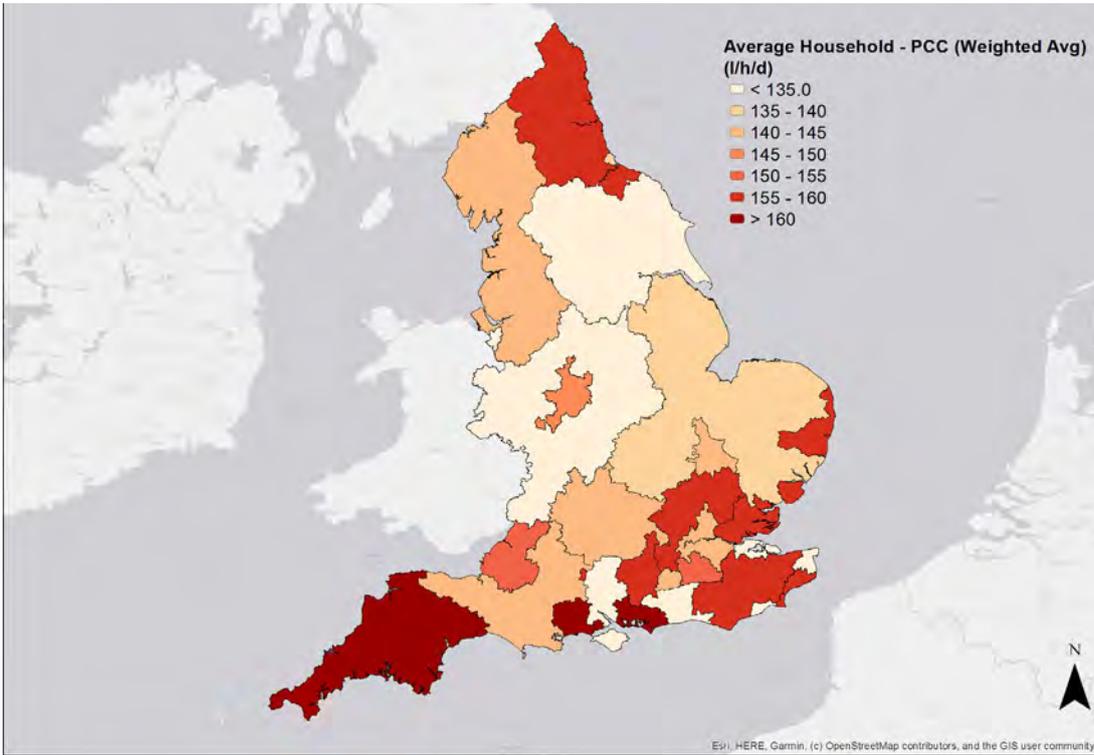
England's performance is comparable with equivalent Northern European countries' compliance on water quality, bathing water, and the Urban Wastewater Treatment Directive. The European Environment Agency's data shows that it will be challenging for most EU Member States to achieve good ecological status for all water bodies in the timeframe of the Water Framework Directive.

England adopted advanced monitoring for persistent chemicals in 2019. The new monitoring showed that no surface water bodies achieve good chemical status due to three persistent pollutants – mercury, polybrominated diphenyl ethers (PBDE – historically used as flame retardants), and perfluorooctane sulfonic acid (PFOS – a textile stain repellent and fire-fighting chemical). These are known as ubiquitous, persistent, bioaccumulative, toxic pollutants. Although these substances are now banned or restricted in the UK, it is almost impossible to remove them from the water environment and they need to break down or disperse naturally, so can remain in the environment for decades. Without ubiquitous, persistent, bioaccumulative, toxic pollutants, 94% of England's water bodies reach good chemical status. Other countries that undertake this advanced monitoring, such as Germany, Sweden, and Austria, have similar results.

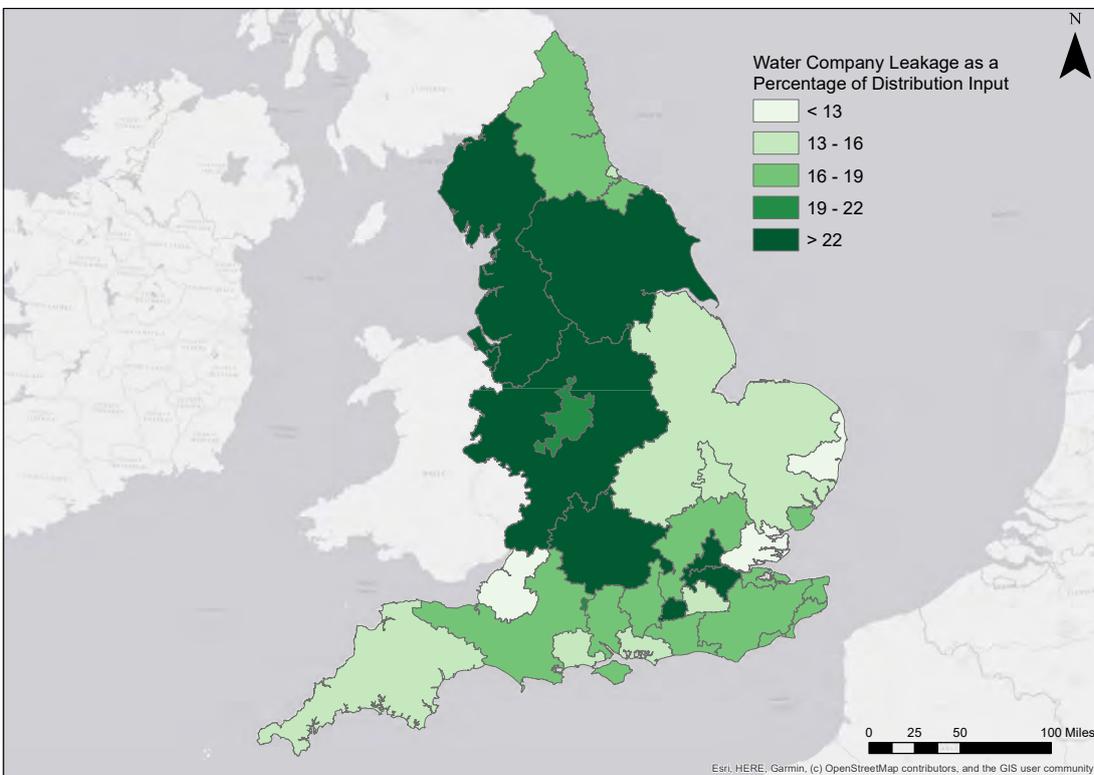
Around two thirds of our protected nature sites, such as SSSIs, are dependent on the water environment. This includes nationally and internationally important wetlands, rivers, and lakes that are highly sensitive to environmental pressures. Only 22% of lakes and 12% of our protected freshwater rivers and streams are in favourable condition, principally due to nutrient pollution from wastewater and agriculture.

## **The supply/demand gap**

Water companies provide around 14 billion litres of water a day for public water supply. On average, households use 144 litres of water per person per day. The National Infrastructure Commission has recommended, due to the increasing pressures, that around 4 billion litres of additional water a day will be needed in England by 2050. The challenge increases when considering the regional variation of water use across England (see figure 3) caused by different types of industry and population levels, as well as current levels of water company leakage (figure 4). This Plan sets out how we will close this gap through increased supply and greater water efficiency, including reducing leakage.



**Figure 3:** Water consumption in litres per person per day, mapped by water company in England (average for metered and non-metered households) in the period 2021 to 2022.



**Figure 4:** Leakage as a percentage of 'distribution input' mapped by water company in England in the period 2021 to 2022. 'Distribution input' is the amount of water put into the water supply distribution network by water companies.

## Who is responsible for managing the water system?

Each of us, including water companies, farmers, regulators, and departments across government have a role to play in managing these pressures and improving the water system.

The UK government, principally through **Defra**, is responsible for setting the overall legal and policy framework for water in England. These laws set out requirements for people and industries. This covers everything from fishing licences for individuals, drinking water quality regulations for water companies, and advice for farmers, to the comprehensive regulatory framework that governs the water industry - both users and suppliers.

Within government, other key departments involved include the **Department for Transport**, which is responsible for aspects of the transport network, like strategic roads, that are a source of pollution in water bodies, whilst the **Department for Levelling Up, Housing and Communities** is responsible for housing and planning.

Water policy is devolved across the UK. Given we share cross border river catchments, we will continue to work closely with the Devolved Administrations to consider the application of the Plan to these catchments.

Defra is also the lead department for our principal arm's-length bodies and regulators.

Recognising the monopoly afforded to water and sewerage companies alongside their statutory obligations, **Ofwat** (a non-ministerial department) acts as the economic regulator holding the water companies to account on cost-effective delivery of agreed plans. The government issues a Strategic Policy Statement to Ofwat, setting government's priorities for Ofwat's regulation of the water industry in England.

The **Environment Agency** implements the permitting and licensing regimes, with inspections and enforcement action. The Environment Agency also leads on the development of the Water Industry National Environment Programme and is responsible for assessing the water resource planning for each water company.

**Natural England** is the government's advisor on the natural environment. They protect and improve England's natural environment and advise on the impacts on water dependent habitat sites.

The **Drinking Water Inspectorate** provides independent reassurance on the quality of drinking water. It also investigates disruption to supply, and the quality of water supplied, including the role of local authorities regarding private water supplies.

Government and regulators use a variety of powers and levers available to improve the water system, particularly focusing on regulation of the water industry, and licences and permits for industry. Most recently, we enacted new powers through the Environment Act 2021 to improve the water environment and the resilience of our water supply. We have already started to use these powers in collaboration with regulators - we legislated for specific targets to improve water quality and reduce water demand. Ofwat are changing water and sewerage company licence conditions to link dividends to performance, including environmental performance, after we gave Ofwat powers through the Environment Act 2021 to change water and sewerage company licences without consent from these companies.

Finally, businesses and individual households also have a role to play, including complying with permits and disposing of items responsibly – for example, not putting fats and oils down sinks or other items like wet wipes into toilets, not littering, careful management of slurry on farms, installing rainwater butts, sensible use of water, repairing leaks, and using more water efficient resources. These actions will help reduce pollution and our use of water.

## What we have already delivered

### Over the last few years, we have:

- set new legally binding targets to significantly reduce pollution from farming, wastewater, and abandoned metal mines, and a water demand target to increase the resilience of supplies and leave more water in the environment
- made the environment a key priority in our Strategic Policy Statements for Ofwat to channel water industry investment
- supported funding for local catchment-based partnerships to develop local strategies for improving water quality and co-ordination between the public, businesses, and environmental non-governmental organisations
- doubled funding to £15 million to cover all farmland in England under the Catchment Sensitive Farming programme which gives free advice to farmers across the country to improve their practices and reduce pollution
- opened the first year of farming funding through the new Sustainable Farming Incentive to pay farmers to adopt more sustainable farming approaches
- provided funding of £34 million for grants to farmers to upgrade their slurry storage facilities
- required £2.5 billion of investment in wastewater treatment works between 2020 and 2025 to halve phosphorus discharges

- introduced new legal requirements on water companies to upgrade wastewater treatment works to their highest nutrient removal level in designated areas where at protected habitat sites are in unfavourable condition
- published our Storm Overflows Discharge Reduction Plan, requiring water companies to deliver their largest ever environmental infrastructure investment - with an expected £56 billion of capital investment over 25 years
- expanded storm overflow monitors from only 10% in 2015 to over 90% now, with 100% coverage of storm overflows by the end of this year
- unlocked an additional £469 million of investment to develop new large-scale water infrastructure, including transfers, recycling, and reservoirs, and set up the Regulators Alliance for Progressing Infrastructure Development programme to support their delivery
- required water companies to produce high quality Water Resources Management Plans and drought plans to ensure water supply meets our demands, and we are ready for periods of drought in a changing climate
- established the Water and Abandoned Metal Mines Programme which has started work on cleaning up legacy pollution from abandoned metal mines, constructing 3 treatment schemes and 20 diffuse measures so far
- taken action on plastics, including banning microbeads from rinse-off personal care products and banning multiple single-use plastic products
- designated new bathing waters, and we recently consulted on designating more
- improved water quality through the Road Investment Strategy 2020-2025 - so far National Highways has delivered over 30 water quality initiatives, improving almost 20 miles of water bodies
- provided £27 million of funding for local projects to improve the water environment in rural England through the Water Environment Grant

## Our Plan

We will go further to deliver clean and plentiful water. In the 2023 Environment Improvement Plan (EIP23), we set out the first steps of our reform programme for the water system. This Plan builds on this and outlines additional actions we must take to meet our water targets and transform the water system.

We will:

- 1. transform management of the whole water system** - improve how we manage our water system in a joined-up way to make sure it is fit to deliver for water supply and the environment
- 2. deliver a clean water environment for nature and people** - address each of the multiple pressures and sources of pollution on our water bodies
- 3. secure a plentiful supply of water** - meet our long-term water needs for people, businesses, and the environment by closing the 4 billion litre a day supply-demand gap in public water supply

Delivery of this Plan will also contribute to the recovery of nature, achieving Net Zero, and will provide additional environmental, public health and wellbeing benefits.



Aerial view of Saltmarsh on Essex coast



# Chapter 1: Transforming management of the whole water system

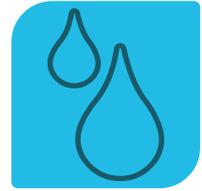
## Integrated approach across catchments

To improve management of the water system, we will take an approach that considers all pressures in the round, rather than in isolation. This integrated approach to water management is the foundation of our plan for water. We will reinforce this with a clear and streamlined policy and legal framework, delivered by regulators and arm's-length bodies working smartly together.

Healthy and naturally functioning catchments hold more water in soils, filter pollutants, and provide essential habitats. This improves water quality, reduces drought, supports wildlife, and increases flood resilience. It also cuts costs to farmers by reducing the amount of fertiliser and other inputs they lose to soil erosion and run-off. Less pollution enters our seas and oceans to protect our marine life. Rivers and groundwaters from which we abstract can store more water throughout the year and provide a more stable water supply for households and businesses.

Water companies can play a part by treating wastewater using both traditional wastewater treatment and nature-based solutions, such as integrated wetlands. Treatment techniques can recover nutrients from wastewater, which means those nutrients can be recycled back via farmers into the soil, supporting a circular economy.

**What is a catchment?** A water catchment is an area of land through which water from rain, melting snow, or ice, drains into a body of water such as a river, lake, or reservoir



## Case study: Bristol Avon Catchment Partnership

The Bristol Avon Catchment is a unique and beautiful network of rivers, streams, and lakes. Over the past 300 years, the river has been progressively constrained by hundreds of weirs, walls, and culverts. Together with run-off from agriculture and urban areas, this has led to poor water quality and degraded habitats for wildlife.

The Bristol Avon Catchment Partnership, co-hosted by Wessex Water and the West of England Rural Network, was one of the original pilots of the 'Catchment-Based Approach' in 2012. In the past, management of the water environment has been fragmented. The catchment-based approach brings together all organisations and groups to make decisions at a river catchment scale.

So far, the Bristol Avon Catchment Partnership Fund has funded 44 projects, contributed £230,000 in funding, and secured a further £326,000 in match funding. This has been used to deal with water-related issues, from supporting community groups to improve their local water environments, to aiding the recovery of healthy and diverse fish populations. Significantly, the outcomes from these projects have led to further investment in excess of £7 million.



**Pulteney weir in Bath, on the Avon**



## 1.1. Join up water management in catchments

We will identify problems and solutions in a coordinated, collaborative way by bringing organisations and funding together to deliver water improvements. River catchment groups, including water companies, local authorities, and internal drainage boards, are an integral way of delivering this. Catchment groups have invested over £15 million in 10 years, raised an additional £45 million from wider sources through catchment-based approaches, and enhanced around 310 miles of river per year. We will build on this success.

Nature-based solutions deliver multiple benefits for the environment, when used in the right places. Catchment-based decision making, supported by the right data, helps identify these locations and enables direct investment where it can deliver the most impact. It is essential to bring together the different sources of funding available to improve the water environment - from environmental land management schemes to 'biodiversity net gain' delivery. In our Strategic Policy Statement to Ofwat, we were also clear that water companies should increase their use of nature-based solutions to complement other schemes to improve the water environment.

We will:

- improve delivery and coordination at a catchment level with tailored long-term catchment plans that cover all water bodies - catchment plans will set out the key issues and priorities for action, including priorities identified in Local Nature Recovery Strategies
- increase funding for catchment groups and improve their capacity to deliver improvements through the right tools, data, and approaches
- unlock more green finance to manage water in an integrated way by removing barriers which limit investment in nature-based solutions - as outlined in our new Green Finance Strategy published last month

We will deliver tailored long-term catchment action plans with new funding for local groups to improve all water bodies in England



## 1.2. Streamline our water policy and legal framework

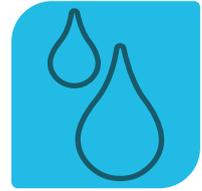
A clear and robust framework underpins our whole management of the water system. The current water and floods policy and legal framework has been developed incrementally over time, resulting in over 15 national plans and strategic documents. Whilst each plan has its own purpose, we want to make the whole framework more outcome-focused and fully integrated with other environmental plans and government delivery plans. This will ensure efficient delivery of our water policies on the ground across catchments, and an increase in the use of nature-based solutions.

The Water Framework Directive and its implementation through River Basin Management Plans was introduced in 2000. To deliver improvements in the quality of the water environment, we consider there to be opportunities to improve the regulatory system through reviewing the implementation of the Water Environment Regulations 2017 now that we have left the EU. For example, we can improve the targeting of investment to ensure environmental improvements are done where they will have the greatest impact, to achieve our objective of restoring 75% of waters to good ecological status, and continuing to take an ecosystem approach to managing the water environment.

We will:

- better integrate water and flood planning by reforming River Basin Management Plans and flood risk management planning - ensuring integration with water company plans
- align water and flood planning with Local Nature Recovery Strategies and the future Land Use Framework to make sure we are taking actions - especially nature-based solutions - where they will have the biggest impact
- review the implementation of the Water Environment Regulations 2017 to improve on-the-ground water outcomes whilst retaining our goal to restore 75% of water bodies to good ecological status - we will consult on any proposed changes

Our policy and legal framework will be more streamlined, with greater join-up between water and flood planning, and aligned with Local Nature Recovery Strategies



### 1.3. Smarter regulation

The water regulators and arm's-length bodies work together to ensure all sectors, for example the water industry and the farming industry, are fulfilling their legal responsibilities. Within the water industry, the current environmental performance of water companies is mixed. Some have not met expectations or have not improved at the pace required by the public, regulators, and government.

Government and regulators are taking further steps to drive improvements in water company performance across the whole industry. This means more co-ordinated action across the regulators of the water industry when necessary. We will strengthen our powers, including those of regulators, to hold water companies and other responsible parties to account for cleaning up water bodies.

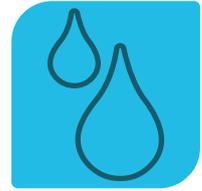
We are:

- increasing the Environment Agency's enforcement capacity by boosting their budget by an extra £2.2 million a year
- holding water companies to account - regulators are undertaking the largest investigation in history into water company compliance with environmental law
- enabling Ofwat, through new powers in the Environment Act 2021, to change water company licence conditions without consent, and link water company dividend payments to environmental performance
- supporting Ofwat's changes to ensure that shareholders, not customers, will pay for water company executive bonuses where these companies are unable to demonstrate their pay award decisions reflect performance expectations

We will:

- change the law to increase the maximum amount the Environment Agency can penalise water companies for damaging the environment - we are consulting on the penalty cap options, including our preferred proposal to remove the cap and enable the Environment Agency to issue unlimited penalties

We will fund more inspections and set new targets for the Environment Agency's oversight of water companies



- expand penalties to include a wider range of environmental offences
- review permit charges on water companies to fund more inspections and set new targets for the Environment Agency's oversight of water companies
- work with Ofwat to require improvements, where necessary, to the oversight of water company performance at executive and board level
- support Ofwat and the Environment Agency to update the memorandum of understanding which exists between them for enhanced joint oversight of water companies

Water companies will face bigger penalties if they break the law

## We are accelerating water company infrastructure

Around £1.6 billion of new investment will be directed into vital infrastructure to improve the water quality of our rivers, lakes, and coastal waters and secure future water supplies.

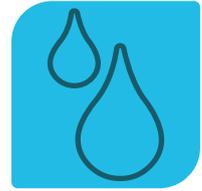
Defra commissioned water companies to accelerate investments over the next two years to decrease storm overflow discharges, reduce nutrient pollution from treatment works, and address water resilience challenges. Ofwat agreed that these schemes could be funded through its transition expenditure programme and, on 3 April, it published its draft decisions, taking into account the views of the Environment Agency, the Drinking Water Inspectorate, and the Consumer Council for Water. Ofwat's consultation on its draft decisions will close on 24 April 2023.

As part of the new package of investment, companies will spend around £1.1 billion to eliminate 10,000 storm overflow discharges per year in areas including Lake Windermere, the River Wharfe, Falmouth, and Sidmouth. Around £160 million will fund improvements at 14 wastewater treatment works, which will significantly reduce phosphorus pollution in protected site catchments and support sustainable housing development.

The new investment will also include around £400 million for 18 schemes to increase our water resilience, with projects that increase water capacity as well as encouraging water efficiency and reducing leaks on customer pipes.

These new schemes will deliver our goal of clean and plentiful water and provide an important boost for regional jobs, businesses, and local communities.

Further information on the new infrastructure projects can be found in [Ofwat's accelerated investment delivery project plan](#).



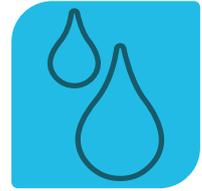
## 1.4. Improve data and analytics

Over the last decade we have significantly improved monitoring of water bodies. Before 2010, monitoring was insufficient. We ramped up the number of sites monitored in 2013 and had a fully comprehensive 'census' of the state of the water environment in 2015. This provided a strong baseline for metrics and a better-informed approach to testing. Our monitoring and reporting is now targeted at locations where there are likely to be problems, so we can be more agile with effective interventions.

We will:

- complete roll-out of monitors by the end of this year to assess the frequency and duration of all storm overflow discharges across the country - we are currently at over 90% roll-out
- change the law to require continuous water quality monitoring upstream and downstream of storm overflows and wastewater treatment works to understand the impact on water quality in real-time
- deliver the Natural Capital Ecosystem Assessment programme to create a smarter, more innovative, and accessible evidence base - including monitoring in more places and creating more metrics
- improve and modernise our modelling capability so we can predict how effective policies are, detect emerging threats and assess how changes to the climate, economy, and technology could impact water

All storm overflows  
will be monitored by  
the end of this year



## Case study: Stiffkey River catchment 'digital twin'

Data is essential to effective decision making at a catchment level.

Microsoft, Anglian Water, and Avanade are developing a 'digital twin project' for the river Stiffkey catchment in North Norfolk. The River Stiffkey is almost 20 miles long and at moderate ecological status. The catchment covers over 14,000 hectares.

Digital twins are data-driven, digital representations of processes and systems, and can be used to build a 'virtual model' of a river catchment. The digital twin presents information on effluent flows, historic effluent and river water quality data, biodiversity data, river flows, storm overflows, and weather. In the future, this could radically improve the ability of decision makers to forecast and model different scenarios for river improvement at a catchment level.

By unifying the various sources of data and making them transparent and available to users, from farmers to environmental groups, it will improve decision-making at a catchment scale and give local communities better information about the catchment environment.



**A swan resting beside the River Stiffkey**



Beachy Head, Sussex



The Green Bridge over the  
River Swale, Yorkshire



# Chapter 2: Delivering a clean water environment for people and nature

A healthy water environment is essential for human health and wellbeing, wildlife, and the economy. We can only meet our commitments to reverse the decline in species abundance with clean and plentiful water.

When in a healthy and naturally functioning state, rivers, streams, ponds, lakes, wetlands, estuaries, and coasts deliver multiple benefits for society. These benefits include flood risk management, carbon sequestration, clean water, and drought resilience. Access to blue spaces can also boost health and wellbeing. Restoring our water habitats will mean that people and wildlife can still benefit from these ecosystems for generations to come.

## New Funding

We already direct investment towards improving the water environment. Through the environmental land management schemes, we are rewarding farmers who go beyond the regulatory minimum and take actions to improve the environment. Through the Water Industry National Environment Programme, we set out the actions water companies must do to improve the water environment.

### 2.1. Launch the Water Restoration Fund

We are creating a new Water Restoration Fund to further boost investment in our precious natural environment. The Water Restoration Fund will be made up of money from water company environmental fines and penalties which come from water company profits. This will be additional to the money water companies must already pay to clean up the impact of pollution incidents that breach their permit conditions.



Since 2015, the Environment Agency has concluded 56 prosecutions against water companies, resulting in record fines of over £141 million. In 2019, Ofwat required Southern Water to pay £126 million for breaching environment commitments. This package saw Southern Water pay a fine of £3 million, with £123 million returned to customers. Currently the money collected from fines and penalties is returned to HM Treasury.

We will:

- channel the money from water company environmental fines and penalties into projects across England which improve the water environment through the newly created central Water Restoration Fund
- fund a wide range of projects to improve the water environment, water management, and restore protected sites, which will include activities such as re-meandering rivers; removing invasive non-native species; creating and restoring water-dependent habitats, such as wetlands; removing barriers to enable fish and other species' natural movement in rivers; and supporting catchment partnership groups in local delivery

Our new Water Restoration Fund will use money from water company fines and penalties - taken from company profits, not customers - and reinvest this into water environment improvements



## Reducing pollution from wastewater, urban areas and transport

Pollution from towns, cities, and transport negatively impacts our water environment. We will step up our actions to keep pace with the growing pressures from climate change, population growth and urbanisation.

### Case study: Thames Tideway Tunnel

London's Victorian sewers were designed to serve 4 million people. Now, nearly 9 million people live in London, using that same sewerage network. Storm overflows are being used too often to relieve the pressure on the network.

In 2016, Thames Tideway began constructing a new "super-sewer" for London – the Thames Tideway Tunnel. Connecting Acton and Greenwich to the Abbey Mills Pumping Station, this is the largest water infrastructure project ever undertaken in the UK, costing £4.4 billion.

The innovative financial support package provided by government means Tideway, the private sector company financing and building the tunnel, has been able to access low-cost borrowing to fund the project. The 15-mile tunnel will offer radical improvements to the current sewerage network. Once complete, the Thames Tideway Tunnel will be connected to the Lee Tunnel to form the London Tideway Tunnel, reducing spills by 95%.



**The Thames Tideway Tunnel under construction**



## 2.2. Improve wastewater treatment

Wastewater is treated by water companies and returned to the environment. Although this removes almost all harmful substances, treated wastewater is still one of the biggest pressures on the water system. In particular, treated wastewater is the biggest source of phosphorus in rivers. When there is too much phosphorus in water bodies, eutrophication can occur. This results in excessive growth of algae and aquatic plants, leading to algal blooms and less oxygen for species.

By reducing nutrient pollution from wastewater, we will improve water quality and protect our habitat sites, whilst also reducing existing nutrient mitigation requirements on developers and helping to facilitate the delivery of sustainable housing.

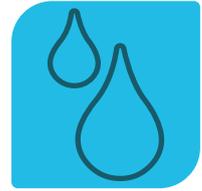
To drive improvements in wastewater treatment, we have set a new, ambitious, legally binding target in the Environment Act 2021 to reduce phosphorus from treated wastewater by 80% by 2038 against a 2020 baseline. In EIP23 we set an interim target to achieve a 50% reduction by 2028.

Wastewater treatment processes generate roughly 15% of all greenhouse gas emissions from the waste sector. To meet their contribution to net zero, water companies need to use more sustainable treatment methods, such as nature-based solutions like integrated wetlands. Integrated wetlands can be installed at the end of a wastewater treatment work. The wetland removes excess nutrients from the wastewater whilst also providing other environmental benefits such as carbon capture and habitat creation.

We are:

- requiring water companies to invest £2.5 billion to reduce nutrient pollution from wastewater treatment works between 2020 and 2025
- requiring water companies to upgrade 160 wastewater treatment works across the country to the highest standards for phosphorus removal by 2028, which will see at least a 50% reduction in phosphorus pollution by 2028 relative to a 2020 baseline

We are requiring water companies to reduce phosphorus from treated wastewater by 50% by 2028



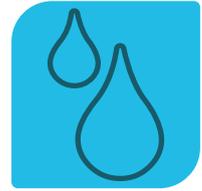
- encouraging water companies to use treatment methods that produce fewer greenhouse gas emissions, remove more nutrients, and deliver multiple environmental benefits, for example, integrated wetlands, as set out in our Strategic Policy Statement to Ofwat

We will:

- reduce nutrient pollution from wastewater treatment works in habitats sites in unfavourable condition by requiring water companies to upgrade their wastewater treatment works to the highest standards for nutrient removal - this will allow for the use of nature-based solutions, such as integrated wetlands, to remove nutrients, and lead to an estimated reduction of around 70% in phosphorous loads and around 57% in nitrogen loads from wastewater treatment works
- explore the potential to generate resources, heat, and energy from wastewater to feed into the national grid by commissioning research to improve our understanding of emissions from wastewater, and using lessons learned from projects such as Low Carbon Farming's greenhouse projects, which aims to capture waste heat from nearby water treatment works and inject it into greenhouses through ground source heat pumps
- promote a circular economy by commissioning research on alternative wastewater treatment methods that use fewer chemicals, use less energy, and recover waste nutrients, such as biological treatment and nature-based solutions

### **2.3. Reduce storm overflow discharges**

Storm overflows are the result of Victorian infrastructure. The system combines rainwater from gutters, pavements, driveways, and roads, with wastewater from toilets, bathrooms, and kitchens in the same pipes to move it to wastewater treatment works. Storm overflows are designed to operate as a safety valve to stop sewage backing up into properties during heavy rainfall when the pipes fill up.



A growing population, an increase in hard surfaces, water bodies disconnected from their floodplains, and more frequent and heavier storms because of climate change are putting the system under increased strain. The government has driven increased monitoring, including putting new duties on water companies through the Environment Act 2021, and this has shown that storm overflows are being used far too often.

Solving this problem is a significant task. While we have stopped new developments from combining pipes, there are over 62,000 miles of combined sewers in England, enough pipework to go two and a half times around the Earth. Improving on this situation requires delivering significant new investment to improve current infrastructure without resulting in disproportionately large increases to customer bills. Eliminating all discharges could cost up to £600 billion, increasing annual water bills up to around £820 per annum by 2049.

We want to see nature-based solutions used, where appropriate. For example, Wessex Water have made effective use of reed beds to accommodate excess water when groundwater infiltrates the sewerage network, reducing overflow to rivers. The reed beds, meanwhile, provide a valuable habitat for species such as dragonflies and warblers.

Although we cannot instantly stop all overflows being used, we are directing huge investment to address the issue. In August 2022, we published the landmark Storm Overflows Discharge Reduction Plan which will see the toughest ever crackdown on pollution from storm overflow spills. It sets new requirements on water companies to deliver the largest infrastructure programme in water company history - £56 billion of capital investment over 25 years to reduce storm overflows. This will be used to fund a range of projects, for example separating surface water so that it doesn't mix with sewage and is diverted to water gardens or wetlands instead, or installing wastewater treatment technologies at storm overflows themselves, so that the risk of harm from discharges is reduced which will reduce the volume of wastewater entering the sewerage network.

Water companies will invest £56 billion over 25 years to reduce storm overflows as a result of the Storm Overflows Discharge Reduction Plan



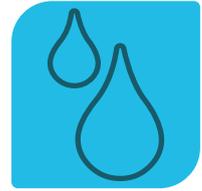
We are:

- increasing transparency and enabling swifter enforcement by regulators by requiring water companies to install event duration monitors on all storm overflows - we will achieve 100% roll-out by the end of 2023 - up from only 10% in 2015
- taking action now by ensuring water companies deliver over 800 improvements to storm overflows throughout England by 2025
- building one of Europe's largest privately financed infrastructure projects to reduce sewage discharges - £4.4 billion will be invested in the Thames Tideway Tunnel - a 15-mile-long 'super sewer' 7.2 metres in diameter, that will be completed in 2025

We will:

- tighten permits issued to water companies for storm overflows to make sure water companies deliver the targets in the Storm Overflows Discharge Reduction Plan
- commission water companies to provide action plans on all permitted storm overflows across the country - this will allow government and regulators to drive delivery of the Storm Overflows Discharge Reduction Plan
- introduce an enhanced and world-leading monitoring programme requiring water companies to monitor and report, in near-real time, the impact that storm overflows and sewage treatment works have on water quality to inform swimmers and other recreational users of our rivers and beaches

We will commission water companies to develop action plans for every permitted storm overflow in the country



## Timeline of action on storm overflows

**Since privatisation:** Action was taken to reduce sewage discharges from storm overflows to designated bathing waters. Between 1989 and 2020, approximately 7,000 storm overflows were improved.

**July 2013:** The government instructed water companies to comprehensively monitor when and for how long their storm overflows operate. In **2015**, only 10% of overflows had monitors, by **2022** it was over 90%, and by the end of **2023** it will be 100%. This increase in monitoring has revealed the extent of the sewage discharge problem.

**2015 to 2020:** £3.5 billion was invested to improve the environment. Action on storm overflows was focused on rolling out monitoring to more than half of all overflows.

**2020 to 2025:** Water companies are investing £7.1 billion on environmental improvements. This includes £3.1 billion invested in storm overflows - on the Thames Tideway Tunnel super-sewer, and over 800 storm overflow improvements across England by 2025.

**August 2020:** We set up the Storm Overflows Taskforce, with representatives from Defra, Ofwat, the Environment Agency, the Rivers Trust, Consumer Council for Water, and water industry, to support the design of the Storm Overflows Discharge Reduction Plan.

**March 2021:** The Environment Agency published annual spill data for all monitored storm overflows for the first time.

**November 2021:** We put in place a raft of new requirements in the landmark Environment Act 2021 to address pollution from storm overflows:

- a duty on government to publish a plan to reduce sewage discharges from storm overflows and to reduce their impact
- a duty on water companies and the Environment Agency to publish data on storm overflow operation on an annual basis
- a duty on government to produce a report setting out the actions that would be needed to eliminate storm overflows in England and the costs and benefits of those actions
- a duty on water companies to publish near real time information (within 1 hour of commencement) of an overflow, its location, and when it ceases
- a duty on water companies to monitor the water quality upstream and downstream of a storm overflow or a sewage disposal works
- a duty enshrined in law to require water companies to secure a progressive reduction in the adverse impacts of discharges from storm overflows



## Timeline of action of storm overflows continued

**August 2022:** We published the **Storm Overflows Discharge Reduction Plan**.

**February 2023:** We outlined that all water and sewerage companies in England will need to produce an action plan on every storm overflow in England.

**March 2023:** Defra and Ofwat announced £1.1 billion of new investment, starting in the next two years, to eliminate 10,000 storm overflow discharges a year across 10 schemes, including Lake Windermere, the River Wharfe, Falmouth, Sidmouth, Solent, Chichester and Langstone harbours and the North Kent coast. These schemes are subject to a consultation, which closes on 24 April 2023.

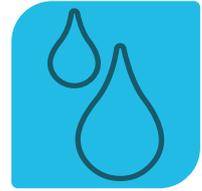
### 2.4. Design towns and cities for water sustainability

Many of our towns and cities have been paved over with hard, impermeable surfaces causing rainwater to enter the sewerage system, or to directly enter water bodies, rather than soaking into the ground. Sustainable drainage systems such as rain gardens, ponds, wetlands, and grass roofs reduce the amount and speed of water being added to the water system. These reduce the risk of surface water flooding, improve water quality, and benefit wildlife. Reducing the pressure on the sewerage system will reduce the use of storm overflows. Yorkshire Water have demonstrated the effective use of 'rain gardens', combined with arrangements to separate surface water and control the flow, to reduce the amount of water entering the sewerage system and the use of storm overflows in Leeds. Many organisations, including water companies, local authorities, and housing developers, have a role to play in the design of our drainage and sewerage system.

We are:

- requiring standardised sustainable drainage systems in new housing developments in 2024, subject to final decisions on scope, threshold, and process following consultation in 2023

We are rolling out standardised sustainable drainage systems in all new developments



We will:

- improve drainage and water quality, and reduce surface water flood risk, by requiring water companies to produce Drainage and Wastewater Management Plans\*
- consider how planning policy can promote local design decisions that reduce surface water flooding and water scarcity through, for example, dual pipe systems and water reuse options
- consult on whether to make water companies statutory consultees on certain planning applications

## 2.5. Reduce pollution from transport

Water running off roads, railways, and airports can carry pollutants directly into water bodies. Most microplastics entering the water environment from the Strategic Road Network are from car tyres and road marking abrasions being washed into water bodies.

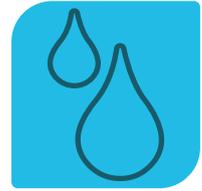
Run-off from the Strategic Road Network, along with pollutants from other sources, contribute to water bodies not achieving good ecological status. National Highways manage the Strategic Road Network according to the requirements set out by the Department for Transport and prioritise action through the Road Investment Strategy. A smaller number of water bodies are also impacted by roads managed by local highway authorities. Treatment systems - including nature-based solutions - can be put in place to capture and filter pollution run-off at outfall drains before being discharged into water bodies.

We are:

- improving water quality through the Road Investment Strategy 2020-2025 - so far National Highways has delivered over 30 water quality initiatives, improving almost 20 miles of water bodies through mitigation of medium-, high-, and very high-risk outfalls and other river enhancement projects

We are considering actions to reduce the impacts of the strategic road network on water quality as part of developing the next Road Investment Strategy

\* Also known as Drainage and Sewerage Management Plans



We will:

- consider what actions government can take to bring forward or reprioritise ongoing work to reduce the impacts of the strategic road network on water quality as part of developing the next Road Investment Strategy - this process will involve considering the responses to the forthcoming public consultation on National Highways
- work across government to explore targeted action on roads managed by local highway authorities where evidence shows transport pollution is preventing a water body from achieving good ecological status

We are designing agricultural schemes and other incentives so that farmland alongside rivers creates space for nature

## Farming and our rural landscape

Farmers and rural landowners have a critical role in protecting and enhancing the rural landscape and water environment. There are many examples of good environmental management by farmers, however, we must acknowledge that agriculture is a significant source of pollution, particularly of nitrogen, phosphorus, and sediment. Whilst all three are needed to successfully grow food, there are opportunities to reduce their run-off into the water environment. Our new farming schemes will support farmers to improve water quality and create new habitats.

To drive progress, we have set a new legally binding target under the Environment Act 2021 to reduce nitrogen, phosphorus, and sediment from agriculture entering the water environment by 40% by 2038, with an interim target of 10% by 31 January 2028, and 15% in catchments containing protected sites in unfavourable condition due to nutrient pollution by 31 January 2028.



## Case study: The Upper Axe Landscape Recovery Project

The River Axe, a Special Area of Conservation in Dorset and Devon, is polluted as a result of agricultural and rural land activities. This is leading to loss of habitats and fish species.

The Upper Axe Landscape Recovery Project, which brings together more than 20 farmers, smallholders, and landowners in the area, aims to improve the condition of the Special Area of Conservation and restore over 14 miles of the River Axe. The use of regenerative farming techniques and extensive grazing along the river corridor will reduce the diffuse pollution entering the river. The project also plans to recreate a rich mosaic of water-dependent habitats, including floodplain meadows, wet woodlands, and wood pasture.

As a result, the quality of the water in the river and adjacent habitats should improve, allowing a host of rare species to flourish, including water voles, otters, common toads, and kingfishers in the floodplains, while Atlantic salmon, brown trout and lampreys will have more opportunity to spawn and mature in the river channel. The local community will also benefit from the project, from purer water, increased access, and reduced flood risk.

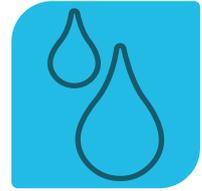


Livestock along the River Axe

## 2.6. Encourage and incentivise best farming practices

A healthy environment supports profitable food production. Planting crops on fields in winter promotes healthier soils that absorb and retain more water and prevents erosion. This helps to refill groundwater aquifers to protect against drought. Grassy and wetland buffer strips reduce run-off of pollutants and sediments into our rivers. Our goal is that farmland alongside rivers is involved in creating space for nature, reducing run-off, and supporting river recovery in farming and rural landscape.

We will increase uptake of our farming schemes to cover 70% of farmland and 70% of all farms by 2028 - up from the current 34% of farmland



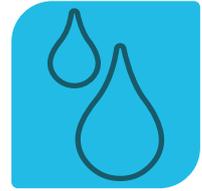
We are transitioning away from the EU's Common Agricultural Policy scheme and reinvesting the same funding into the sector through our environmental land management schemes. We are setting up three schemes to pay farmers and land managers to provide environmental goods and services alongside food production. Actions funded by environmental land management schemes are essential to deliver clean and plentiful water.

We are:

- expanding the successful one-to-one farmer advice and guidance programme by doubling the funding available for the Catchment Sensitive Farming programme to £15 million to cover all farmland in England

We will:

- pay for water body buffers to help farmland alongside rivers create space for nature, reduce run-off, and support river recovery, and consider regulation in future if needed
- increase uptake of our farming schemes to cover 70% of farmland and 70% of all farms by 2028 - up from the current 34% of farmland
- deliver six new Sustainable Farming Incentive standards this year with actions that will benefit the water environment
- identify innovations through the Farming Innovation Fund and secure greater uptake of precision farming



## What are the environmental land management schemes and what are they doing for the water environment?

**Sustainable Farming Incentive** will pay farmers to adopt and maintain sustainable practices that protect and improve the natural environment while also supporting food production. Sustainable Farming Incentive is supporting farmers to use their land in a way that keeps valuable nutrients and soil on the farm and stops them running off into water bodies.

**Countryside Stewardship** will pay for more targeted actions in specific locations, features, and habitats. Countryside Stewardship is paying farmers to create and manage habitats and provide natural flood management, protecting the water environment. There will be an extra incentive for people to join up across local areas to deliver bigger and better results through Countryside Stewardship Plus.

**Landscape Recovery** will pay for bespoke, longer-term, larger-scale projects to improve the natural environment. The first round of projects will restore 400 miles of rivers and streams.

## 2.7. Reduce pollution from farms

Since 2019, 5,437 farms have been inspected and provided with advice, leading to over 8,202 improvement actions. Where farmers do not take inspectors' advice, regulators will be expected to enforce the law. Since February 2022 the Environment Agency has started formal enforcement action against over 140 farms.

We are:

- delivering 4,000 farm inspections per year by boosting funding to the Environment Agency – targeting protected nature sites in an unfavourable condition
- improving farmer compliance by trialling new innovative methods for checking compliance through our Testing Approaches to the Regulation of Agriculture project (Project TARA) and spending £1.3 million per year engaging with farmers to influence them to change practices

We will consult on extending environmental permitting to dairy and intensive beef farms and improve permitting of pig and poultry farms



- applying environmental permitting to large intensive pig and poultry farms

We will:

- consult on proposals to extend environmental permitting to dairy and intensive beef farms
- improve the effectiveness of environmental permitting of pig and poultry farms in reducing water pollution while working to maximise the efficiency of the permit setting process
- work with farmers to review and improve our farming laws to make them clear, simple, and effective at improving the environment

## 2.8. Improve and transform manure management

Manure from livestock is a valuable resource. It improves soil health and increases organic matter, which helps crops grow and soil retain water. However, when it is in liquid form – known as slurry – it can be difficult and expensive to use properly. Mismanagement, such as spreading on frozen or waterlogged ground, causes serious nutrient pollution and wastes a valuable resource, whilst increasing costs to farmers.

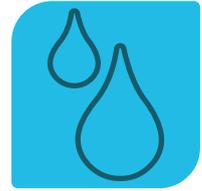
We are:

- improving farm infrastructure through Countryside Stewardship funding, for example, roofing for manure stores to keep dirty water and effluent separate from rainwater and prevent contamination

We will:

- provide £34 million of funding through the Slurry Infrastructure Grant for new and expanded covered slurry stores in the highest priority areas of England, for example protected nature sites in unfavourable condition, with even more funding in 2023 and 2024
- enable on-farm technologies for better use of slurry, including slurry separators, and help farmers store, transport, and apply their organic nutrient through

We are more than doubling our first round of the Slurry Infrastructure Grant for farmers to £34 million, with further rounds to be launched later in 2023



the Farm Equipment and Technology Fund - building on nearly £9 million of investment offered in the first round

- work with farmers and innovators to identify and promote the use of technologies that improve the efficiency of manure nutrient use and reduce pollution risk
- facilitate organic fertiliser use through new fertiliser product laws which help give buyers confidence on nutrient content, contaminant risk, and other features of products derived from manures

## 2.9. Improve regulation of private sewage discharges

In addition to farms, large numbers of properties in rural areas of England rely on on-site water treatment systems as they are not connected to mains sewerage systems. Septic tanks are the most common on-site sewage treatment systems in these areas and are regulated to ensure they are maintained properly and do not cause pollution.

Septic tanks and private sewage treatment works that are not water companies' responsibility can cause nutrient pollution if not properly maintained. It is estimated that there are approximately 700,000 private sewerage systems in England. We need to manage the risk to the environment proportionately by enabling homeowners to keep private sewerage systems well maintained and supporting those most in need. Maintaining private sewerage systems can prevent more costly repairs that often only come to light when people sell their homes.

We will:

- manage the risks from private sewage discharges by reviewing existing regulatory arrangements including, for example, better registration
- explore funding and other support options for improving septic tank activities

We are exploring funding and other support options to improve septic tanks that pollute the water environment



## Restoring water habitats

Healthy water habitats are essential for wildlife to thrive. In the Environment Act 2021 we set an apex target for nature to halt the decline in species abundance by 2030. In EIP23 we committed to protecting 30% of our land for nature by 2030. Our work to restore the water system is a fundamental part of achieving these goals.

In EIP23 we pledged that everyone should live within a 15-minute walk of a green or blue space

### Case study: Salmon to South Yorkshire

Up until the beginning of the 19th century, the River Don in Yorkshire had an abundant salmon population. This ended as a result of the industrial revolution, when many weirs were built to provide power to mills and allow boats to navigate the river, and the river was polluted by the city's industry and burgeoning population. Salmon were extinct in the Don by the end of the 18th century.

As a result of water quality improvements, by the late 1990s and early 2000s small numbers of salmon were seen below the river barriers in Doncaster. To allow the iconic salmon to return to their historic spawning grounds further upstream, the Don Catchment Rivers Trust, along with Yorkshire Water, the Environment Agency, the Canal and Rivers Trust, and local authorities worked for over a decade to build a series of fish passes, easements and weir removals along the Don.

For the first time in 200 years, salmon can now move from the Humber all the way up the River Don to spawning grounds in and around Sheffield.



The new fish pass at Masbrough weir



## 2.10. Restore protected nature sites

Protected nature sites are internationally important for their abundance of unique wildlife. Two thirds of these sites are dependent on the water environment. Our extensive inland and coastal wetlands are host to many migratory bird populations, particularly ducks, geese, and wading birds. Of the designated wetlands in England, 73 have been classified under the Ramsar Convention on Wetlands as being of international importance. However, these habitats are under significant pressure from pollution and abstraction.

In EIP23, we repeated our commitment to restore 75% of protected sites to a favourable condition by 2042. To drive progress, we set interim targets that by 31 January 2028 all protected sites will have an up-to-date condition assessment, and 50% will have actions on track to achieve favourable condition.

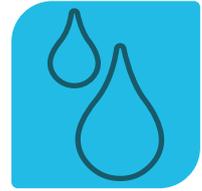
We are:

- ensuring action to reduce pollution from wastewater (action 2.2) and agriculture (action 2.7), as well as managing abstraction (action 3.4), is targeted in unfavourable protected nature sites
- identifying and mitigating specific diffuse water pollution affecting water dependent protected habitats through the implementation of Diffuse Water Pollution Plans
- providing £100,000 to local planning authorities in areas where water dependent habitat sites are in unfavourable condition due to nutrient pollution, to support the delivery of nature-friendly nutrient mitigation schemes

We will:

- design and deploy Protected Site Strategies where these can provide a route to site recovery and support strategic approaches locally
- incentivise farmers and land managers to take action through our new farming schemes which are expected to contribute at least 50% of the target of bringing 75% of protected nature sites into favourable condition by 2042

Our new farming schemes are expected to deliver at least half of the change needed to get 75% of protected nature sites to favourable condition by 2042



- reduce nutrient pollution to restore our protected sites and support sustainable development - including introducing a new Nutrient Mitigation Scheme supported by up to £30 million of government funding enabling the creation of new wetland and woodland habitats across the catchments where protected sites are in unfavourable condition - promoting nature recovery and improving access to green space, whilst facilitating the delivery of sustainable housing

## 2.11. Protect and restore chalk streams

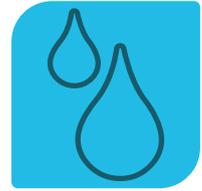
England is home to 85% of all chalk streams. They are the most biodiverse of all English rivers and their special natural heritage makes them England's equivalent of the Great Barrier Reef. However, chalk streams are threatened by multiple pressures including over-abstraction, agricultural pollution, and physical modifications.

In 2021, the Catchment-Based Approach developed the National Chalk Stream Restoration Strategy. Protecting and restoring chalk streams is a priority and the government, as well as regulators, will play a part in delivering the strategy.

We are:

- reducing the abstraction pressure on chalk streams by designating all chalk catchments as water stressed, which drives action to increase water efficiency
- reducing the amount of water abstracted from chalk streams by enabling abstractors to find more sustainable sources - over the last 15 years the Environment Agency's Restoring Sustainable Abstraction programme has meant 101 million litres less water a day is abstracted from chalk streams
- protecting chalk streams from sewage pollution by designating all chalk stream areas as high priority under the Storm Overflow Discharge Reduction Plan (action 2.3)
- ensuring water companies deliver action in the 2020 to 2025 Water Industry National Environment Programme

We are leveraging £1 million investment in partnership projects each year to improve chalk catchments in addition to supporting the delivery of the National Chalk Stream Restoration Strategy



We will:

- support delivery of flagship chalk stream restoration projects - ensuring water companies take action through the next Water Industry National Environment Programme by making chalk streams a priority in our Strategic Policy Statement to Ofwat
- increase investment into restoring chalk catchments - leveraging £1 million investment in partnership projects each year starting in 2023
- address the impact of agricultural pollution on chalk streams by considering chalk streams in the development of environmental land management schemes
- look for opportunities to deliver on other recommendations published in the Chalk Stream Restoration Strategy, and protect chalk streams, for example reviewing the impact of private sewerage systems on chalk streams

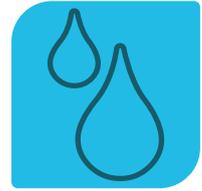
## 2.12. Improve the condition of our peatlands

Around 11% of England is covered by peatland, with the majority of upland peatlands located in our National Parks. Healthy peatlands contain around 90% water. Peatlands slow the flow of water through the catchment, stabilise river levels, and purify water. This reduces flood risk and makes our rivers cleaner. The estimated annual value to water supply from British peatlands is around £500 million a year.

Over the last few centuries, our peatlands have been degraded due to drainage, afforestation, cultivation, burning and overgrazing. This damages wildlife and increases carbon emissions. Degraded lowland agricultural peat accounts for 3% of England's overall greenhouse gas emissions and reducing this will require rewetting.

Our England Peat Action Plan, published in 2021, sets out the government's plan to restore, responsibly manage, and protect upland and lowland peatlands. In 2021, we commissioned the independent Lowland Agricultural Peat Task Force to improve the condition of England's peat in the lowlands, comprising some of our most productive agricultural land.

We are launching a new £6.6 million Lowland Peat Research and Development programme



We are:

- delivering the world leading England Peat Action Plan
- supporting the uptake of farming on rewetted peat - known as paludiculture - through the £5.6 million Paludiculture Exploration Fund from 2022 to 2025, to support agricultural production and environmental restoration working hand in hand
- encouraging water companies to restore upland peatlands to help purify river water - reducing costs at water treatment works whilst helping nature

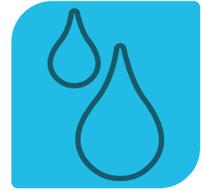
We will:

- identify the best way to reduce emissions from peatlands – launching a £6.6 million Lowland Peat Research and Development programme in 2023
- improve our understanding of the lowland peat water challenge and transform the way we use water in these landscapes by developing infrastructure pilot projects from 2023 to 2025
- improve incentives for landowners to ‘re-wet’ peatlands through environmental land management schemes

### **2.13. Restore the natural process of water bodies**

Human activity over the last few centuries has modified our water bodies and stopped them from functioning naturally. The modifications are a result of our urban, industrial, and agricultural development over hundreds of years - it is the same for many industrialised countries. Some of these modifications can harm ecology, for example, straightened rivers or redundant dams stop fish migration and disrupt the flow of rivers and can lead to flooding downstream. We can help to restore natural processes of water bodies by planting trees alongside them or by removing redundant structures.

Other modifications, however, serve an essential purpose for society by providing drinking water, flood protection, navigation or increasing health and safety. These water bodies are categorised as artificial or heavily modified water



bodies. Artificial or heavily modified water bodies have either been created where no water body existed before, such as canals or reservoirs, or have been heavily altered by human activity. 4 out of 10 water bodies are designated as artificial or heavily modified.

While we can remove redundant physical modifications in water bodies, it is not beneficial to remove modifications which serve an important function, so instead, we mitigate the impact of the modification on the environment. For these water bodies, we are aiming to meet 'good ecological potential' instead of 'good ecological status' (see '**what is good ecological potential?**' below). The current approach to mitigating the impacts of the modification is complex and is a barrier to improving the ecological potential of water bodies.

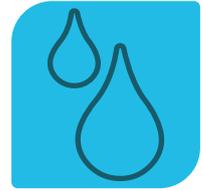
We are:

- encouraging tree planting along rivers through the England Woodland Creation Offer and enabling private investment for woodland creation through the Woodland Water Code
- boosting tree planting by investing £2 million through our four-year Woodlands for Water programme
- partnering with water companies to meet and exceed the water industry target of planting 11 million trees by 2030

We will:

- remove redundant physical modifications and restore natural processes using funding from the Water Restoration Fund (action 2.1)
- target the water bodies where modifications are having the biggest impact on wildlife and are stopping us achieving our biodiversity targets
- improve artificial and heavily modified water bodies by making it simpler to identify and deliver the actions to reduce the impact of modifications on the water environment

We will remove redundant physical modifications and restore natural processes using funding from the Water Restoration Fund



## What is good ecological potential?

Artificial or heavily modified water bodies will not function the same as 'natural' water bodies and will not meet good ecological status. We therefore judge the health of artificial or heavily modified water bodies using ecological potential.

Ecological potential is determined by an assessment of whether measures are properly in place to mitigate the impacts of the modification on the ecology in the water body. For example, planting reed beds alongside a concrete bank or a fish pass over a weir. Good ecological potential is the maximum potential an artificial or heavily modified water body can reach. If all mitigation measures are in place, and the water chemistry is assessed as good, then the water body is classified as good ecological potential. The biological elements are monitored, but not included in the assessment of good ecological potential. As with good ecological status, the 'one-out-all-out' principle applies, meaning the potential of the water body will follow the worst scoring element.

## 2.14. Address invasive non-native species

Invasive non-native species (INNS) threaten wildlife and damage the economy. They are 1 of the top 5 drivers of wildlife loss globally. Aquatic species are more invasive than terrestrial ones, as they move easily through rivers and canals. Managing the impact and slowing the spread of INNS is challenging because different sectors of the economy undertake activities that can introduce INNS and increase the spread. The Great Britain Invasive Non-Native Species Strategy is a vital step in coordinating actions nationally to prevent INNS in the water environment.

We are:

- removing INNS from water bodies using biocontrol, for example using weevils to remove floating pennywort
- preventing the spread of INNS by raising awareness through campaigns such as 'Check, Clean, Dry' and 'Be Plant Wise' - working in partnership with water companies and local groups
- bolstering enforcement to prevent the introduction of INNS through the newly formed GB Non-native Species Inspectorate
- limiting the spread of INNS by implementing our Pathway Action Plans that address the highest risk routes for INNS to spread, such as regional water transfers

We are bolstering enforcement to prevent the introduction of invasive non-native species through the newly formed GB Non-native Species Inspectorate



## Reducing other pollutants

Chemicals are an important part of our economy, supporting food production, enabling thriving industry, and producing medicines. By using chemicals wisely, we can keep people and wildlife safe. However, there are many legacy issues, such as past mining activities, that still release chemicals and impact water quality.

### Case study: Force Crag

The Force Crag mine was the last working mine in the Lake District National Park, operating from 1835 until 1991. Cadmium, zinc, and lead are washed out of the mine through drainage tunnels and from mining waste tips. These metals pollute over 6 miles of rivers and Bassenthwaite Lake, harming fish and river insects.

The government's Water and Abandoned Metal Mines programme, a partnership between Defra, the Coal Authority, and the Environment Agency, worked with Newcastle University, the landowner, and the National Trust to develop a nature-based treatment scheme to capture the metals before they pollute the river. The resulting 'compost-based pond' system was built in 2014. This harnesses natural chemical and biological processes to capture the metals as the mine water passes down through a layer of compost and woodchips. The treatment system removes over 90% of the metals from the mine water, capturing nearly half a tonne of metals each year, improving water quality in 6 miles of local rivers. It was the first full-scale compost-based system at an abandoned metal mine in Europe. The site design reflects more than 10 years of research to deliver a solution which respects the sensitive location in the Lake District National Park, supporting public access, and requirements to protect the Scheduled Monument and Site of Special Scientific Interest.



**Force Crag mine with mine water treatment ponds in the background**



## 2.15. Mitigate pollution from abandoned metal mines

Pollution from our industrial heritage still contaminates our waters. Abandoned metal mines, dating back to the 1800s, pollute around 930 miles of rivers in England and are the largest source of metals in rivers and seas. These metals can have a serious impact on fish and other wildlife. They also impact upon the marine environment, as metals in river sediments flow into our seas and harm marine life.

Government is responsible for reducing pollution from metal mines that were abandoned before the year 2000. The Water and Abandoned Metal Mines Programme was set up in 2011 between Defra, the Environment Agency, and the Coal Authority to deal with water pollution caused by abandoned metal mines. Under the Environment Act 2021, we have set a new legally binding target to halve the length of rivers polluted by harmful metals from abandoned mines by 2038. This target also supports wider obligations in the marine environment for meeting our commitments under the UK Marine Strategy and the Convention for the Protection of the Marine Environment of the North-East Atlantic.

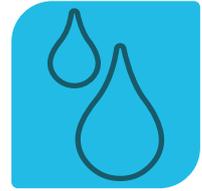
We are constructing  
8 new metal mine  
water treatment  
schemes by 2028

We are:

- reducing the amount of harmful metal pollution in rivers by constructing 8 mine water treatment schemes and 20 diffuse actions, such as lining riverbanks with stones to prevent erosion, by 31 January 2028, and aiming to deliver up to 40 new mine water treatment schemes and a similar number of diffuse actions by 2038

We will:

- develop cheaper methods to that use little or no chemicals or energy, such as nature-based solutions, to capture metals via treatment ponds containing a reactive layer of material like straw, compost, or woodchips in which naturally occurring bacteria capture the metals



## 2.16. Address legacy land contamination

Pollution can enter the water environment, especially groundwater, from land that has been contaminated. Polluters are responsible for preventing, remedying, and controlling pollution and the damage that it causes through the polluter pays principle. There are, however, multiple public authority or 'orphan' sites that still need cleaning up where industrial activities have ceased and the polluter cannot be found. The responsibility for remedying these sites falls to local authorities. Landfill tax must be paid when removing waste from these sites. However, the additional cost is a barrier for a public body, such as a local authority, to remediate these sites and bring them back into beneficial use for redevelopment.

We are:

- developing a grant scheme to fund the costs of landfill tax to public bodies in England, where such costs are a determinative barrier to the remediation and redevelopment of contaminated land

## 2.17. Prevent microplastics entering the water system

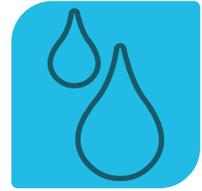
Microplastics can enter the water environment through multiple sources, for example from tyre particles, microfibrils from clothes generated during washing, the atmosphere, and microbeads in personal care products. Materials that contain plastics, such as wet wipes, break down into smaller pieces when in the water environment.

Wastewater treatment works remove up to 99% of microplastics, however, due to the high volume of microplastics entering the sewerage system, even just 1% can still cause damage to the environment. It's important to stop microplastics entering the water system in the first place. For example, filters on washing machines can remove microfibrils before they enter the sewerage system. However, they can be costly to install, with estimates of up to £120 per machine.

We are:

- increasing our understanding of the levels and extent of microplastics in the water environment, and their impact on humans and wildlife, by developing methods

We will consult on changing the law to ban the sale of wet wipes containing plastic



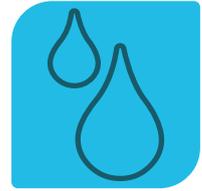
to measure the amount and types of microplastics and microfibres in rivers and sediment

We will:

- change the law to ban the sale of wet wipes containing plastic – subject to public consultation – and work with industry to ensure plastic-free alternatives are available, building on recent action from retailers including Boots and Tesco in response to public calls to address plastic in our water system
- support the Water UK communications campaign to “Bin the Wipe” and write to the relevant producers and advertising authorities regarding the labelling of wet wipes as “flushable” – this action will also help reduce pressure on the sewerage system and the use of storm overflows
- expect industry to develop low cost, effective microfibre filters on washing machines and encourage their effective use

## **2.18. Minimise the risks and impacts of chemicals and pesticides**

We have robust laws in place to manage risks from chemicals, including pesticides, supplemented with policies to support safe and sustainable manufacture and use. Through the UK REACH work programme, we assess the risk from chemicals to human health and the environment across Great Britain. We then identify and develop the necessary legal actions. Any pesticide must pass a scientific risk assessment before it may be placed on the market, and all authorised pesticide products have legal conditions of use that must be followed. This includes rules to minimise the risk of pesticide entry into water. Chemicals can enter the water environment through a range of different sources, for example, through air, land, and water at industrial sites.



Chemicals can enter the water environment through a range of different sources, for example, through air, land, and water at industrial sites.

PFAS (perfluoroalkyl and polyfluoroalkyl substances) are highly persistent chemicals, sometimes referred to as ‘forever chemicals’. They are used in lots of every-day products, such as keeping food from sticking to packaging or pans, making clothes resistant to stains, and making firefighting foam more effective. They remain in the environment for years after use and move between different parts of the environment, including soil and water bodies. Since they are used in a range of different processes and products, managing continued use, emissions, and existing pollution is a significant challenge.

Other chemicals entering the water environment, such as heavy metals (action 2.14) and pharmaceuticals like antibiotics, can contribute to antimicrobial resistance. In 2019, we set out a cross-government 20-year vision and National Action Plan to deal with antimicrobial resistance. This includes actions to gather information on the risks of antimicrobial resistance in the water environment.

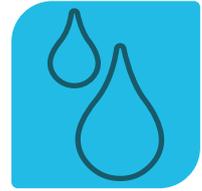
We are:

- minimising chemical contamination between air, land, and water from industrial sites by expanding the Environmental Permitting Regulations to apply to small industrial sites which are currently only regulated for air emissions
- developing the next 5-year National Action Plan on antimicrobial resistance, which will be informed by findings from the National Action Plan call for evidence and analysis from the Pathogen Surveillance in Agriculture, Food and the Environment project

We will:

- reduce the amount of PFAS entering the water environment following the recommendations of the UK REACH Regulatory Management Options Analysis on PFAS through starting to develop a UK REACH restriction proposal on PFAS in firefighting foams this year

We are proposing new restrictions on the use of ‘forever’ chemicals (PFAS) which impact our rivers and seas



- undertake further work to prepare for further restrictions on other uses of PFAS, including consumer products such as textiles, cleaning products, paints, and varnishes
- better manage the risk from harmful chemicals in water by updating the list of priority substances used to determine chemical status
- set out our priorities for addressing health and environmental risks from chemicals, how we will use and improve our laws, and how we can encourage a move to more sustainable use of chemicals by publishing a new Chemicals Strategy in 2023
- support greater uptake of integrated pest management across all sectors and the development of alternative approaches to increase the pest control options available to farmers through publication of a UK National Action Plan for the sustainable use of pesticides in 2023
- ensure water companies go faster to introduce tighter controls on certain chemicals, including perfluorooctane sulfonic acid (PFOS) and cypermethrin, to ensure we reduce contamination from these substances as soon as possible



Aerial view of a Circular Slipway,  
Ardingly Reservoir West Sussex



## Chapter 3: Securing a plentiful supply of water

The public, businesses – such as the farming sector and energy sector – and wildlife all rely on a steady supply of clean water. Climate change is already impacting our water resources through more intense drought and flooding, so we need to go further to deliver clean and plentiful water.

This means increasing water efficiency by using what we have more carefully and continuing to invest in new water resources infrastructure. We are acting now to deliver water security into the future.

Water companies can and must step up to address leakage and mains bursts, which are contributing factors to consumer disruption including temporary use bans. When it comes to enforcement, nothing is off the table.

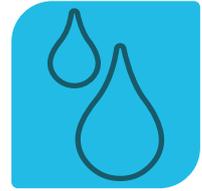
Our farmers are becoming increasingly concerned about crop failure and wildfires in these extreme conditions. We must make sure that we are incentivising them – through schemes like the Farming Investment Fund which includes the Farming Equipment and Technology Fund – to invest in water storage and technology like trickle irrigation, to make more efficient use of water.

We will also build the resilience of our water infrastructure, encouraging private investment and fast-tracking approvals for alterations to reservoirs and water recycling facilities as well as new projects.

### Increasing the supply of water

Water companies currently provide around 14 billion litres of clean water a day for public water supply. This ensures a steady supply of high-quality drinking water to people's homes and businesses. Half of the 4 billion litre a day gap in public water supply by 2050 will be delivered through increased supply.

We will deliver half of the 4 billion litre a day gap in public water supply by 2050 through increased supply



## Case study: Felixstowe Hydrocycle

Agriculture forms an important part of the economy in coastal Suffolk. It also uses a lot of water. Farmers estimate that they already need a further 3 billion litres per year to meet current irrigation demand. East Anglia is the driest part of England.

Meanwhile, every year 1 billion litres of water, generated by urban and agricultural drainage systems, is pumped from the Kingsfleet catchment into the River Deben by the East Suffolk Internal Drainage Board to protect agricultural land from flooding. This results in damage to nearby saltmarshes and mudflats.

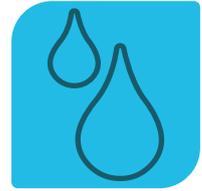
Felixstowe Hydrocycle Ltd was formed by six local farmers, supported by the Environment Agency, Suffolk County Council, East Suffolk Internal Drainage Board, and the University of East Anglia, in order to increase the sustainable supply of freshwater for farms further inland.

Felixstowe Hydrocycle have helped develop and install a new 7-mile pipeline and pumping and storage system. Water will be distributed to participating farms where it will be stored in reservoirs. Sufficient capacity will be built into the system to help meet stakeholder demands in the future. As a local business, Felixstowe Hydrocycle serves as a blueprint for what can be done to improve access to water, and has the potential to influence water management across East Anglia and the rest of the UK.

Felixstowe Hydrocycle has also conducted an innovative trial to show that surplus flood water captured in winter, can be safely returned to aquifers underground. This technique, known as Managed Aquifer Recharge, could provide an increased resource for the environment and agricultural needs.



**Saltmarshes along the Suffolk coast**



Our regulatory framework requires planning so that water companies and water users can be prepared for current and future pressures on water supply. These processes need to be robust to meet people's needs. Since 2009, water companies have been required to produce Water Resources Management Plans and drought plans every 5 years. Water Resources Management Plans detail how water companies will manage water supplies over the next 25 years and beyond. Drought plans are short-term strategic plans setting out how water companies will maintain a secure water supply and protect the environment during dry weather and drought.

In 2020, we published the National Framework for Water Resources. This established five regional groups responsible for delivering collaborative regional plans, setting out how the supply of water for people, business, industry, and agriculture will be managed. Drought and regional plans inform Water Resources Management Plans and investment decisions.

### **3.1. Enhance water supply infrastructure**

To address future pressures on the system we need new water supplies from multiple sources, including reservoirs, water recycling, and water transfers from one part of the country to another. Whilst no new reservoirs have been built in 30 years, some have been expanded significantly in that time.

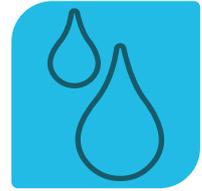
We are:

- supporting Ofwat to ensure water companies invest in new, large-scale water supply infrastructure through the Regulators Alliance for Progressing Infrastructure Development, which brings together the water regulators to speed up processes and work more strategically - water companies are investing £469 million between 2020 and 2025 to develop these water supply options

We will:

- streamline the planning framework for consenting nationally significant water resources infrastructure - our National Policy Statement for Water Resources Infrastructure sets out the needs and policy framework for such major infrastructure in England, leading to faster decision making and fewer delays for water resources projects

Our new National Policy Statement for Water Resources Infrastructure will lead to faster decision making and fewer delays for water supply projects



- improve value for money of large projects by supporting the use using innovative financing arrangements, as was used for the Thames Tideway Tunnel, and encouraging water companies to use more competitive tendering, such as direct procurement for customers
- ensure that new water supply resources infrastructure projects, like reservoirs, deliver biodiversity net gain

### 3.2. Improve resilience to drought

Prolonged dry periods put strain on water companies' ability to supply drinking water to customers. Dry periods also impact water-reliant industries, such as farming and energy. We need to ensure that our water supplies are resilient to drought and any impacts are minimised.

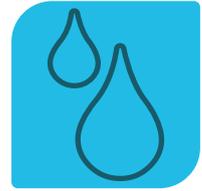
We are:

- using new evidence and innovation to improve our resilience to drought and flood risk, for example through UK Research and Innovation's new Floods and Drought Research Infrastructure, with investment in digital infrastructure, including work on hydrological modelling
- mitigating the impacts of future droughts through the National Drought Group which brings together senior decision makers, water companies, and key water user groups to reduce the impacts of drought
- working with UK Water Industry Research to review the code of practice to improve the co-ordination and communication across the industry
- accelerating new investment of around £400 million to improve water resilience by increasing water capacity and encouraging water efficiency

We will use new legal powers to direct water companies on regional plans for water resources

We will:

- ensure water companies have high quality drought plans in place to make short-term tactical decisions to respond to drought without damaging the environment
- refresh the National Framework for Water Resources ensuring that regional plans improve joined up decision making and water resources planning across all the big abstractors in each region



- commence and use new powers introduced by section 78 of the Environment Act 2021 to direct water companies on regional plans to make sure they deliver the outcomes we need on collaboration
- work with industry to ensure temporary usage bans are implemented in a fairer way for all water users when UK Water Industry Research update the code of practice

### 3.3. Secure supply of water for farmers

Clean and plentiful water is vital for food security. We are supporting farmers to build their resilience to drought by increasing their on-farm storage and developing more efficient methods of using water on their land. This will support our commitment to, at a minimum, maintain the current level of food we produce domestically.

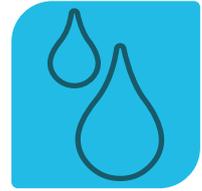
We are:

- aiming to increase the amount of water stored by the agriculture and horticulture sectors by 66% by 2050 to support food production and protect the water environment
- providing £10 million of grants to help around 100 farmers with the costs of building on-farm water reservoirs and irrigation equipment, through the first round of the Water Management Grant under the Farming Investment Fund
- allowing farmers access to water when needed in drought and enabling farmers to refill their reservoirs at more times in the year, while still protecting the environment
- making it easier and quicker for farmers to get abstraction licences and prioritising abstraction permit applications for farm storage reservoir grants and associated habitat risk assessments

We will:

- review the allocation of abstraction rights, including improvements to water trading, to make better use of available water, for example improving collaboration between farmers who have spare water with those who do not have enough

We are providing  
£10 million of  
grants for on-farm  
reservoirs and  
irrigation equipment



- launch the second round of the Water Management Grant this year - offering more funding for on-farm reservoirs and irrigation equipment in addition to providing advice on abstraction licence applications and their link with the planning process
- support farmers with Water Management Grant applications, including advice on abstraction licence applications and their link with the planning process
- support development of Agricultural Water Resources Management Plans through the Water for Food Group initiated by the National Farmers' Union
- use existing models of collaboration where there are challenges on abstraction, like Felixstowe Hydrocycle, as a blueprint for water management for farming
- launch a call for evidence on the planning barriers to small reservoirs with a view to helping land managers with water supply

### 3.4. Manage abstraction sustainably

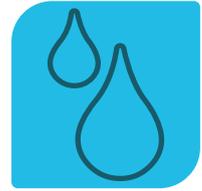
The way we take water from rivers and aquifers can have a significant impact on the natural environment and the wildlife that relies on it. This is particularly the case for chalk streams and for many wading birds that rely on intertidal habitats. Around 15% of all rivers and 27% of all groundwaters are 'over-abstracted'.

We estimate that we need to reduce abstraction from sensitive areas by approximately another 800 million litres per day by 2027, and 1.4 billion litres per day by 2050.

We are:

- continuing to work with licence holders to deliver sustainable abstraction, such as more water storage and improving drainage practices
- licensing previously unregulated abstraction processes, such as those for quarry dewatering, by June 2023

Over the last 15 years, our initiatives have led to, on average, 131 million litres less water a day being removed from the environment, including 101 million litres of water less a day from chalk streams



We will:

- modernise the abstraction system by using technology to make processes more efficient, for example sending e-alerts to reduce or cease abstraction when flow levels are low
- share best practice of water management projects, like Felixstowe Hydrocycle, across sectors

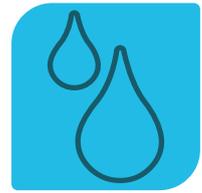
## Managing water demand

The other half of the 4 billion litre a day gap in public water supply by 2050 will be delivered through improving water efficiency, reducing demand, and cutting wasted water.

To drive progress to close the gap, we have set a new legally binding target under the Environment Act 2021 to reduce the use of public water supply in England per head of population by 20% by 2038. To achieve this, we will reduce household water use to 122 litres per person per day, reduce leakage by 37%, and reduce non-household (for example, business) water use by 9% by 31 March 2038. This is part of the trajectory to achieving 110 litres per person per day household water use, a 50% reduction in leakage and a 15% reduction in non-household water use by 2050.

Evidence shows that a catchment-based approach can help drive behaviour change to reduce water demand. River catchment partnerships in England have direct links to their local communities and engage with them on a range of education and engagement, volunteering, and citizen science activities. This direct engagement with the public and local businesses raises awareness within communities and builds local ownership of environmental issues, leading to sustained behavioural change.

We will deliver half of the 4 billion litre a day gap in public water supply by 2050 through improving water efficiency and reducing demand



## Case study: Eddington project

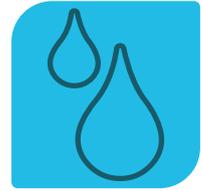
Cambridge suffers a housing shortage. Eddington is the largest real estate project in the history of the University of Cambridge – a wholly new development northwest of the city, it covers around 150 hectares, and will contain about 3,000 homes, as well as academic and community facilities.

Sustainability is a principal goal for the development. As part of this, Cambridge Water, South Staffordshire Water, and the University of Cambridge have joined forces to create the largest rainwater harvesting system in Europe.

The system will give properties two water supplies so recycled rainwater, instead of clean drinking water, can be used to flush toilets, wash clothes and water gardens. Using rainwater reduces drinking water consumption from 144 down to 80 litres per person per day. By installing smart meters, they have performance data and timely water consumption information as well as accurate billing for customers. The system can also mitigate downstream flooding and reduce pressure on the combined sewer system, potentially reducing the use of storm overflows.



**A new lagoon at Eddington**



### 3.5. Improve water efficiency

Small changes can be made to how homes and appliances are designed to reduce the amount of water used and help people make informed decisions. By using water more efficiently, bill payers can cut their costs. Smart meters can be installed without the need for water companies to change their billing procedures where consumers want them. In July 2021 a group of industry experts, chaired by Waterwise, was set up to make sure we are on track to deliver our targets for water efficiency.

We are:

- encouraging water companies to consider how to rapidly increase smart meter installations for household and non-household customers
- delivering the Roadmap to Water Efficiency in new developments and retrofits which sets out 10 new actions that government will take forward (see 'Roadmap to Water Efficiency' below)

We will:

- explore whether improved water efficiency standards can be included in the Decent Homes Standards, when replacing items not meeting the criteria for good repair or reasonable facilities
- review the inclusion of water scarcity information within Energy Performance Certificates for buildings
- develop minimum product standards for water efficiency including for showers, taps, and toilets, following the launch of the mandatory water efficiency label
- strengthen consumer information on water usage, including leakage from everyday structures in the household, through billing and smart metering
- encourage innovation through Ofwat's £100 million water efficiency fund to support the development of a range of new approaches to water efficiency between 2025 and 2030

We are improving water efficiency in homes by developing minimum product standards for showers, taps, and toilets



## Roadmap to Water Efficiency

In EIP23 we launched our roadmap to water efficiency in new developments and retrofits, to be delivered over the next decade.

### **1. Require standardised sustainable drainage systems for new developments subject to final scope, threshold, and process**

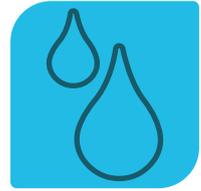
Sustainable drainage systems in new developments can help reduce water use, as well as deliver other benefits for flood risk and water quality. We will consider rainwater harvesting in developing the statutory National Standards for sustainable drainage systems (see action 2.4).

### **2. Review the Water Supply (Water Fittings) Regulations 1999, the Water Supply (Water Quality) Regulations 2016 and/or any other relevant legislation to address wasteful product issues with toilets and enable new water efficient technologies**

Products we use to perform daily household tasks, such as cleaning the dishes, washing, and using the toilet, need to be designed with water efficiency in mind. For example, dual flush toilets enable people to choose between a small flush or a big flush. However, the design of dual flush toilets does not make this choice easy - only 28% of people know which toilet button does what. We will work with stakeholders to improve the design of household appliances to support more efficient water use and design out problems (for example, leaking dual flush toilets). We will publish our response to the call for evidence on toilet leakage in summer 2023.

### **3. Develop clear guidance on 'water positive' or 'net zero water' developments and roles for developers and water companies, including water company incentives**

Future housing developments need to be designed to minimise the pressure they place on the water system especially in water stressed areas. We are working with the Future Homes Hub and Cranfield University to develop and publish guidance on our approach to improve water efficiency in new developments without creating additional barriers or delays to development.



#### **4. Review water efficiency options in planning, building regulations, and voluntary schemes for non-household buildings such as offices and hotels**

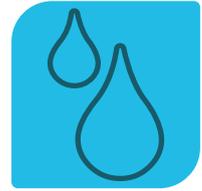
Many local planning authorities specify Building Research Establishment Environmental Assessment Method (a credits-based sustainability assessment) for new non-household developments. This assesses and encourages sustainability and enables developers to be awarded credits for incorporating sustainable measures to buildings including water efficiency, water reuse, and rainwater harvesting. We will investigate how well this approach is reducing demand, and other options, for example voluntary labelling for buildings, based on international examples.

#### **5. Work with Ofwat to ensure the water industry can play a central role in retrofitting water efficient products in households, businesses, charities, and the public sector**

Around 80% of the homes that will exist in 2050 have already been built. Most buildings would benefit from simple cost-effective retrofits to improve water efficiency. Water companies have demonstrated successful retrofit programmes and need to scale these up in their next round of water resources management plans and business plans.

#### **6. Work across government to integrate water efficiency into energy efficiency advice and retrofit programmes**

Improving water efficiency in our buildings will help people to save money on their energy bills. Around 17% of household energy use is spent on heating hot water - the greatest cost after heating homes. Therefore, if less water is used, less water needs to be heated. We will use our updated water-energy-carbon model to inform joint advice and retrofit programmes led by government or industry.



## **7. Review the Building Regulations 2010 and the water efficiency, water recycling and drainage standards (regulation 36 and Part G2, H1, H2, H3 of Schedule 1), considering industry competence and skills**

We wrote to all local authorities last year encouraging them to apply the optional, tighter water efficiency standard of 110 litres per person per day in all new homes and use a fittings-based approach linked to the water efficiency label. We will consider mandating a new minimum water efficiency standard for new homes in England of 105 litres per person per day and 100 litres per person per day where there is a clear local need, such as in areas of serious water stress.

## **8. Deliver the mandatory water efficiency labelling scheme by 2025**

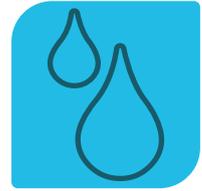
We will publish our response to our mandatory water efficiency labelling scheme consultation in May 2023. We will engage with our stakeholder steering group on the next stages of design and standards to implement the scheme in 2025 (see action 3.5).

## **9. Investigate dual pipe systems and water recycling options for new housing development as part of the review of the planning framework**

Dual pipe systems and water recycling are essential to improve efficiency, whilst also reducing surface water flooding (see action 2.4).

## **10. Enable innovative water efficiency approaches in buildings, including technologies and approaches to funding and maintenance**

We will engage with stakeholders and regulators to ensure programmes can deliver new water efficiency approaches. We will support future Ofwat innovation fund bids that will address evidence gaps for water efficiency.



### 3.6. Reduce leakage

Leakage is at its lowest level since the 1990s. Whilst we have reduced leakage by a third since water companies were privatised, we still lose 20% of the public water supply through leaks in the water pipeline network. We made leakage a priority through the Strategic Policy Statement to Ofwat in 2017 and expect water companies to continue to reduce leakage further, especially as we are asking households to use less water. We have set an ambitious target for water companies to cut leakage by 50% by 2050, which should close 32% of the 4 billion litre a day gap by 2050. Smart meters (action 3.5) will help people know if their pipes are leaking.

We are setting ambitious targets for water companies to crack down on leakage, facing financial penalties if they don't meet them

We are:

- setting a trajectory for water companies to reduce leakage, with targets to reduce it by 16% by 2025, 20% by March 2027, and 30% by March 2032 - water companies have already cut leakage by 11% since 2017
- supporting innovation through Ofwat's innovation fund which includes projects on the 'National Leakage Research Test Centre', 'Leak Detection using Dark Fibre', and using artificial intelligence and drones to find leaks

We will:

- work with Ofwat to hold water companies to account for delivering leakage reduction targets, with financial penalties if they fail to meet them
- reduce non-household water demand using data to enable wholesale and retail water companies to target supply pipe and property leakage and provide water audits for businesses to consider how best to maximise their water efficiency

# Annex A: Assessing the status of water bodies

## How do we test water bodies?

We have an integrated ecosystem approach for the testing and improvement of the water environment (a detailed explainer can be found in the [rules for assessing surface water body ecological status and potential](#)). There are 126 elements used to assess 4,658 surface water bodies and 129 groundwater bodies. Of the underlying tests for all 4,658 surface water bodies, 79% meet the requirement for good ecological status. Not every element is used in every water body. The elements selected will depend on the character of the water, for example whether it is a coastal or river water body. The elements chosen for sampling will also be dependent on the problem that we are trying to detect. For example, in a water body that is mainly impacted by an overload of nutrients, we use the following elements: phosphate, macrophytes and phytobenthos. The full list includes:

- **18 biological elements** (the main indicator) - for example, fish, macrophytes, and phytobenthos (plants that grow underwater or have floating leaves)
- **22 specific pollutant elements** - for example, copper, iron, and zinc
- **10 physico-chemical elements** - for example, temperature, alkalinity, and pH
- **52 chemical status elements** - for example, priority substances or priority hazardous substances and other pollutants for example, priority or hazardous substances and other pollutants
- **4 hydromorphological supporting elements** - for example, changes to the river's shape/flow (these elements are only used to determine if a water body is classed as high rather than good)
- **9 groundwater tests** - for example, increased electrical conductivity (indicating saline intrusion), flow conditions, abstraction, and damage to wetlands

The standards for each element are specific to the sites and type of water bodies. For example, the geology and alkalinity, as well as depth, width, and velocity of a water body, are very different in upland rivers compared to lowland rivers. For example, the River Eden flowing through rural Cumbria, compared to the River Thames in urbanised and densely populated London.

Water body element	Surface water bodies where element at 'good' or higher (%)
Phosphate	45%
Ammonia	92%
Dissolved oxygen	82%
Invertebrates	76%
Fish	42%
Macrophyte & diatom	38%
Specific pollutants	40%
Hydrological regime	31%

**Table 1:** The % of surface water bodies where the element was at 'good' or higher. For example, in 45% of surface water bodies the phosphate element was at 'good' or 'high'.

## Deriving overall ecological status

Overall ecological status is determined by assessing the biological, physico-chemistry, hydromorphology, and specific pollutants statuses of a water body.

**Biology** is assessed by considering fish, macroinvertebrates and macrophytes, and phytobenthos - the overall biological score will be the lowest of all the biological components assessed in the range from bad to high (bad, poor, moderate, good or high).

For **physico-chemistry**, the assessment is done in the same way - pH, phosphorus, ammonia, and dissolved oxygen components are all assessed in the range (bad, poor, moderate, good, high). The overall physico-chemistry score is the lowest of all the physico-chemical components assessed. However, the overall physico-chemical status cannot be classed as poor or bad. The overall range is restricted to moderate to high (moderate, good, high).

**Specific pollutants** are assessed slightly differently and will score as pass or fail depending on the concentrations of the pollutant.

**Hydromorphology** is, again, assessed slightly differently and will score as high or 'not high'.

Our overall aim is to get as close to natural conditions as possible given reasonable anthropogenic use - this is known as 'good status'. The overall ecological status will score good if all assessments are scored good. The one-out-all-out principle means that if any of the elements are assessed as moderate status or below, this lower status will be the overall status. For example, if a water body scores high for physico-chemistry and hydromorphology, but the biology status is moderate, the overall water body ecological status will be moderate.

High ecological status is normally associated with undisturbed conditions, showing no, or only very minor, evidence of impact. The wildlife and biology for water bodies classed as high will correspond to totally, or nearly totally, undisturbed.

The 2019 classification results for each water body type are below.

The classification of all water bodies is available [from the Environment Agency's catchment data explorer](#).

	Rivers	Lakes	Estuaries	Coasts
2019	14%	14%	19%	45%

**Table 2:** The percentage of waters achieving good ecological status by water body type

	Groundwater quantity	Groundwater quality
2019	73%	45%

**Table 3:** The percentage of groundwaters at good quantity (how much water there is) and good quality (how clean the groundwater is).

	Including UBTs	Excluding UBTs
2019	0%	94%

**Table 4:** The percentage of surface water bodies meeting good chemical status in 2019 including and excluding ubiquitous, persistent, bioaccumulative, toxic pollutants (UPBTs).

## Reasons for not achieving good

Water bodies are assigned 'reasons for not achieving good' (RNAG) status to indicate the likely source of pollution or type of pressure that is causing the water body to fail one of the underlying assessments.

Of the components making up good ecological status or potential, phosphate, fish and macrophyte failures cause the most water bodies to fail good ecological status. Physical modification, and pollution from agriculture and rural land, are the primary drivers of these components failing.

Phosphates arise in water bodies on a significant scale due to pollution from agriculture and wastewater from treatment works.

Fish are sensitive to acidification resulting from industrial emissions, excess nutrients (eutrophication) from farming and wastewater treatment works, over-abstraction reducing space and flow in water bodies, and physical modification (installation of weirs and small dams) impeding migration.

Macrophytes (aquatic plants) are similarly sensitive to nutrient pollution. Algal blooms resulting from nutrients can deplete oxygen levels and prevent organisms from surviving, and physical modification can lead to erosion that increases sediment levels in the water, blocking out light and preventing plants from growing.

## Measuring protected sites

Protected sites for wildlife, for example, Special Areas of Conservation and Sites of Special Scientific Interest (SSSIs), use a different measure of environmental condition. This ranges from 'destroyed' to 'favourable'.

The Common Standards Monitoring guidance which can be found [here](#) sets out how we assess the condition of protected sites. There is guidance for monitoring a range of water environments including rivers, freshwater lakes, and canals.

This guidance sets out a series of mandatory attributes which are measured against information collected when the site was notified and set out in the protected sites monitoring specification. The features to be monitored are known as the **interest features** for which the site has been notified or designated. Every monitoring specification is tailored to the site to make sure that it reflects local conditions. The monitoring specification for individual sites can be found on [Natural England's Designated Site online search tool](#).

Common Standards Monitoring for rivers includes information collected as part of the Water Environment Regulations 2017 which contributes to good ecological status, but also includes a range of other attributes. For rivers the attributes measured are:

- flow
- water quality
- habitat structure
- fine sediments
- negative indicators
- biological assemblages
- indicators of local distinctiveness
- direct human disturbance

Favourable condition means that SSSIs features (habitats, species, or geology) are in a healthy state and are being conserved by appropriate management. Favourable condition of SSSIs cannot be attained just through achieving good ecological status. Natural England has a duty to assess whether proposals to carry out operations within SSSIs have a positive or negative effect on the condition of a site.

Natural England categorises the condition of SSSIs as one of the following:

- **favourable** - habitats and features are in a healthy state and are being conserved by appropriate management
- **unfavourable (recovering condition)** - if current management measures are sustained the site will recover over time
- **unfavourable (no change) or unfavourable (declining condition)** - special features are not being conserved or are being lost, so without appropriate management the site will never reach a favourable or recovering condition
- **part destroyed or destroyed** - there has been fundamental damage, where special features have been permanently lost and favourable condition cannot be achieved

# Annex B: Statutory bodies and organisations responsible for the water system

## Key organisations responsible for water

**Defra** is responsible for setting the overall water regulatory and policy framework in England. This includes developing new policies, drafting legislation, and creating special permits, for example, drought orders.

The **Environment Agency** is the environmental regulator in England. They regulate industries including the water and agriculture sectors. They protect and improve the environment by monitoring pressures, investigating sources of water pollution and managing our water resources. They also protect homes and businesses by managing flood risk.

**Ofwat** is the economic regulator of the water and sewerage sector. Ofwat is responsible for protecting the interests of consumers, promoting water company competition, and ensuring that water companies can properly carry out their functions and finance them as well as meet their legal environmental obligations.

**Natural England** is the government's advisor on the natural environment. Their purpose is to protect and improve England's natural environment and advise on the impacts of actions, for example, the impact of permits on protected sites.

The **Forestry Commission** increases the value of woodlands to society, which benefits water management and water quality through, for example, tree planting and woodland creation.

The **Drinking Water Inspectorate** is the drinking water quality regulator. They make sure the drinking water supplied by water companies is safe to drink and meets the legal requirements. They do this by checking the tests that water companies carry out on drinking water and inspecting individual companies.

The **Consumer Council for Water** represents consumers within the water and sewerage sectors. They investigate consumer complaints that have not been satisfactorily resolved by the water companies.

## Other government organisations that have responsibilities for water

The **Department for Levelling Up, Housing and Communities** is responsible for overseeing local government, planning, and building safety to deliver the homes and places our country needs. The purpose of the planning system is to contribute to the achievement of sustainable development, this includes considering measures to reduce pollution, use water efficiently, and minimise the risk of surface water and sewerage system flooding.

The **Department for Transport** is responsible for investing in, maintaining, and operating the strategic road network, comprising around 4,500 miles of motorways and major A-roads in England through National Highways. This transport network needs to be resilient to the risk of surface flooding and mitigate run off from pollution and microplastics into water bodies.

The **Department of Health and Social Care** is responsible for helping people live healthier lives, for which a safe and reliable supply of water is vital.

The **Department for Energy Security and Net Zero** is responsible for securing our long-term energy supply and ensuring the UK is on track to meet our Net Zero commitments. Water is used to produce most forms of energy, requiring an integrated and sustainable management of water and energy. Developing less water-intensive renewable energy is crucial to reduce the high demand currently on our water resources. We also need to reduce the greenhouse gases produced by the water system, including from water and wastewater treatment.

The **Department for Science, Innovation and Technology** is responsible for driving innovation that change lives and sustain economic growth. Science, innovations, and technologies – for example, water storage techniques, wastewater reuse, and rainwater harvesting – are essential to respond to the pressures on the water system.

**Local authorities** have a duty to ensure that water provided in their area is clean and plentiful for human consumption. They carry out risk assessments of private water supply in their area and monitor water quality compliance with drinking water standards. Local authorities provide private water supply monitoring data to the Drinking Water Inspectorate. The Drinking Water Inspectorate shares this information with the Environment Agency.

## Role of water companies

The water and sewerage industry was privatised in 1989. Privatisation has unlocked more than £130 billion of investment in water and sewerage infrastructure, customer service improvements and better water quality. There are 25 regulated companies in the water and sewerage sectors in England. Of these, 16 are regional monopolies that provide either water services, or both water and sewerage services. Most customers are served by monopoly suppliers for their water and sewerage services. The regulators work together with government to ensure the highest levels of environmental and customer protection and services.

People and businesses pay for water to be supplied, and for wastewater and surface water to be removed and treated. Customer bill limits are set by Ofwat every five years through the price review process. Ofwat are currently working on the price review for 2024. This will set price controls for water and sewerage companies for the period 2025 to 2030.

The government issues a Strategic Policy Statement for Ofwat. This sets out the government's priorities for the water industry. Ofwat have a legal responsibility to act in accordance with the Statement in their regulation of the water industry.

## Working with Devolved Administrations

Water policy is devolved across the UK. This Plan applies mainly to England, but some policies concern the performance of water companies which operate in catchment areas that include parts of Wales. Some policies may apply in parts of Wales as a result. This does not apply to Scotland. We will continue to work with the Devolved Administrations to consider the application of the Plan to cross border river catchments as we do now.

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