WildFish.

Sewage pollution

The problem and what we're doing about it

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www.wildfish.org

Summary

Untreated sewage is released into UK rivers, lakes and seas every day. If this is not the result of exceptional weather, **this is illegal**.

Raw sewage enters our rivers through Combined Sewer Overflows (CSOs) – pipes which connect the sewage network directly to rivers.

Meant for use under exceptional weather conditions only, CSOs are increasingly discharging sewage after 'normal' rainfall or even during dry weather.

Water and sewerage companies have failed to invest in an adequate sewerage infrastructure, including treatment works.

Sewage discharges harm water quality and wildlife.

The water industry is responsible for **36%** of UK waterbodies failing to meet their health objectives.

WildFish has been, and will continue to, challenge water companies and regulators to clean up their act.

Photo: *Sewage discharge pipe on Cunsey Beck.*

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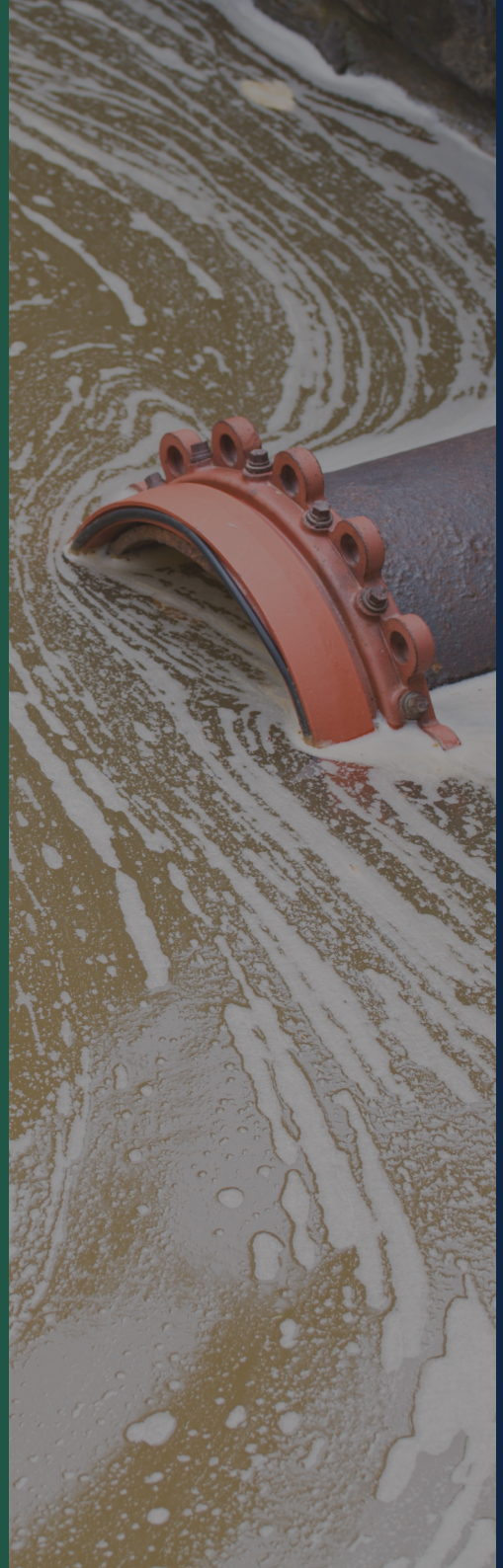
The problem

It is illegal to discharge untreated sewage to rivers in anything other than exceptional rainfall under the 1994 Urban Waste Water Treatment Regulations (UWWTR). This was confirmed in the WildFish Judicial Review (WildFish, 2023).

Raw sewage enters our rivers through Combined Sewer Overflows (CSOs) – pipes which connect the sewage network directly to rivers - which are designed to act as a safety valve in exceptional rainfall but are used in normal conditions to "add" capacity to our waste water treatment works (WWTWs) by bypassing that treatment stage completely.

It is clear, not least due to the excellent work of Professor Peter Hammond (WASP, 2024), that much of the discharging is currently unlawful – he has shown that much raw sewage is discharged from CSOs either when there has not been any significant rain (so-called dry spilling) and even before the treatment capacity of the sewage treatment works has been reached (so-called early spilling).

The reason this has become more public recently is that, finally, we have some monitoring of CSOs. Monitors known as Event Duration Monitors (EDMs) are now on almost all CSOs – as the name suggests, they just record when and for how long CSOs discharge raw sewage.



Reasons for the sewage pollution crisis:

Lack of investment

The most direct cause of the discharge of raw sewage to rivers, lakes and coastal waters has been the failure of the water companies to invest sufficiently to cope with the increase in population, urbanisation and climate change.

Population growth

The UK population has increased by 27 million since 1900 and is expected to continue growing until at least 2050. In simple terms, more people mean more sewage. As Rebecca Pow MP then Minister for the Environment acknowledged in 2022, sewerage infrastructure capacity has not kept up with population growth over many years.

More land development

As our population has grown so too have our towns and cities. Vegetation and permeable surfaces, which allow rainfall to percolate into the ground and generally slow down the speed with which water drains from the land, have been replaced by impermeable surfaces such as tarmac, and concrete.

As a result, rainfall rapidly flows off these surfaces and into the sewers. It also carries any pollutants which may be found in our towns and cities.

Climate change

Climate change is increasing the magnitude and frequency of heavy rainfall events in the UK. Summers are becoming hotter and drier. But winters are becoming milder but wetter.

While the total amount of precipitation in the UK has only slightly risen since 1960, the frequency and magnitude of extreme storm events have increased quite remarkably. Massive downpours, often over short periods, quickly overwhelm the sewer system and CSOs start discharging into rivers.

CSOs

Why do we have them?

When the sewer network was built, CSOs were designed to release untreated or merely screened sewage directly into water bodies during periods of exceptionally heavy rainfall or during an emergency (for example, a power failure at a sewage works).

Usually, some screening is designed into a CSO to remove large items of sewage debris, such as plastics or sanitary items, but that is the only treatment these discharges receive. Screening does not remove any organic or chemical pollutants like microplastics, human effluent or chemicals which pose the greatest risk to aquatic wildlife.

CSOs are a necessary evil in a combined sewer system such as we have in the UK, which was deliberately designed to collect both surface water and sewage into the sewer network.

Without CSOs, very heavy rainfall would mean sewers would quickly fill to capacity, sewage treatment works would be over-whelmed, and sewage would start to back up into people's homes.

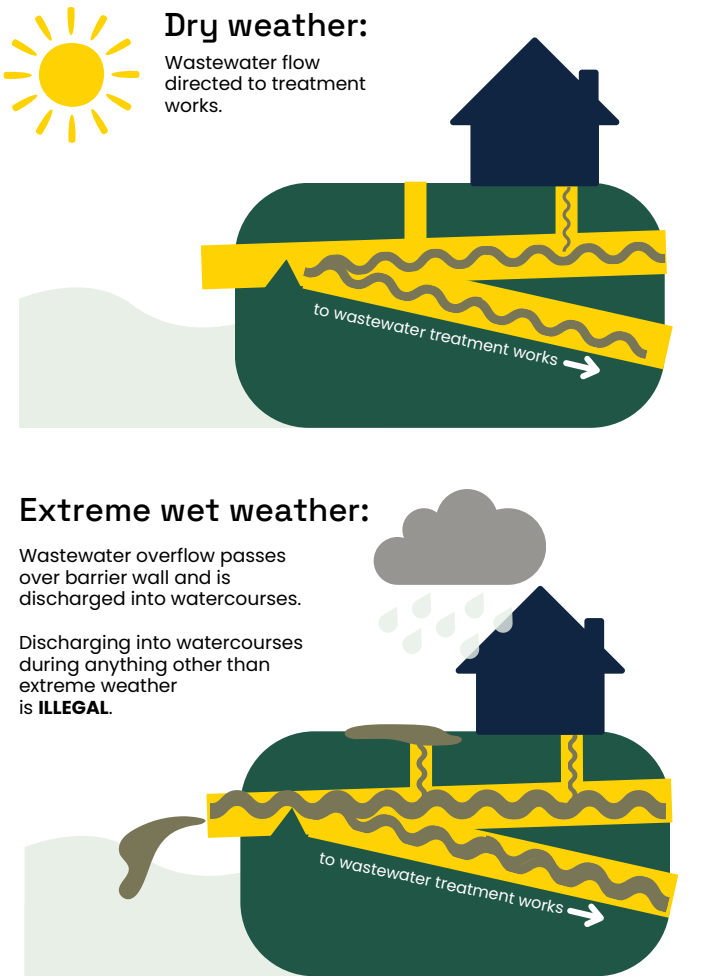


Fig. 1: Diagram showing how Combined Sewer Overflows are supposed to work under dry and extreme wet weather conditions.

Around 15,000

Number of CSOs in operation in England and Wales as of 2022 (Defra, 2022).

Our ageing CSOs:

An ideal, completely new sewer system would not take in rainfall from roofs and hard surfaces. All new additions to the sewer system these days are designed to keep surface drainage and sewage separate, but the vast bulk of the existing UK sewer system is a combined one.

CSOs have come under increasing pressure in recent decades, due in part to growing urban populations, climate change, and lack of sufficient investment to modernise and maintain the system.

The great hope was that privatisation in the late 1980s would enable water companies to raise the capital to invest in the sewage treatment to deal with these changing circumstances, and to provide sewage works capable of treating the higher volumes of sewage that are generated.

This hope has proved to be misplaced. Essentially, the Government's steer to the water companies was to keep water bills lows and sweat their assets at the expense of the environment.

The result of this inadequate investment over 35 years is that the current sewerage system is wholly inadequate to deal with the volumes of sewage that arrive at the sewage treatment works in what might be termed 'normal' conditions.

That is why we are seeing so many discharges of raw sewage from CSOs after just light or moderate rainfall, or even in dry weather. CSOs are being used to manage the lack of treatment capacity, which has led to the unacceptable number of untreated sewage discharges into rivers, lakes, and coastal waters that we see today.

Out of 1,335 CSO's assessed by the EA so far, **exceptional rainfall** has accounted for

0%

of the reasons **raw sewage** is being discharged **into the environment**

Environmental impact

Excess nutrient loading

Discharging raw sewage does great damage to the ecology of rivers, lakes and coastal waters.

Sewage contains high volumes of nitrogen and phosphorus. In excess, these nutrients can stimulate the growth of algae which, in turn, can starve freshwater species of oxygen, disrupting natural food chains.

Chemical residues & mixtures

Sewage contains waste products which are flushed down our toilets and drains, such as bleaches and detergents. Sewage also contains residues of herbicides, pesticides, hormones, medications, paints, solvents, oils and plastics which impact the environment.

Even small amounts of these chemicals, which would not be of great concern by themselves, can combine together to form harmful mixtures that impact a range of species and ecosystems.

Cyanobacteria & sewage fungus

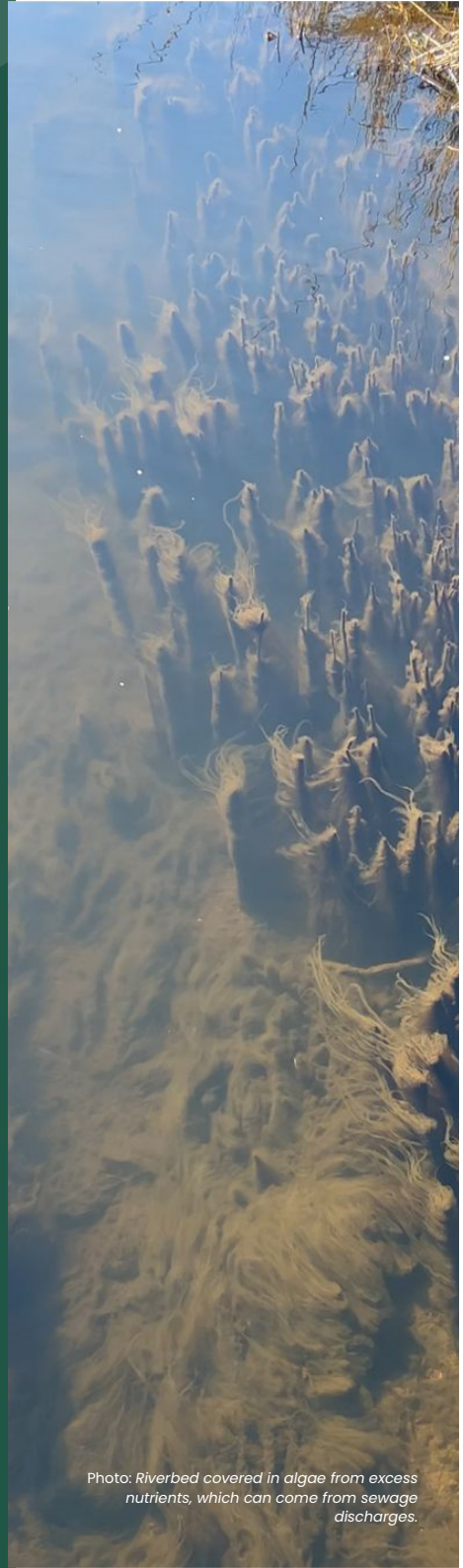


Photo: *Riverbed covered in algae from excess nutrients, which can come from sewage discharges.*

What do the scientists say?

There are many studies showing the detrimental effects of sewage pollution on riverine ecology.

Most recently, researchers from the University of Oxford sampled four UK rivers upstream (controls) and downstream of sewage discharges (Albini et al., 2023). Below the discharges, there were higher concentrations of nutrients (nitrates and phosphates) and growth of sewage fungus, compared to the upstream control sites. Additionally, the researchers found that downstream there was an increase in cyanobacteria (commonly known as blue-green algae) and declines in other 'normal' algae communities (green algae and diatoms). Cyano-bacteria are known to negatively impact aquatic communities, for example, causing mass fish die-offs by reducing oxygen concentrations and releasing toxins into the surrounding environment.

Interestingly, when the researcher's sampling in October 2021 happened to occur a week after a storm overflow event, the results showed further elevated nutrient levels and higher concentrations of cyanobacteria and sewage fungus at the downstream sites.

The impacts of sewage discharges were also seen in the community structure of the freshwater invertebrates. Sites below the discharges had higher overall numbers of invertebrates, but these communities were dominated by pollution-tolerant groups such as Oligochaeta (a group of worms) and Chironomids (non-biting midges) and thus were far from being representative of healthy and diverse freshwater invertebrate biodiversity.

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The evidence, both anecdotal and scientific, is clear. Downstream of sewage discharges, we see a decline in water quality, and with it reduced invertebrate and fish abundance and overall species richness (Galib et al., 2018).

Given the huge number of discharges from CSOs, at tens of thousands of locations across rivers, lakes and coastal waters, the overall impact on riverine ecology is very significant.

Who is to blame?

Water and sewerage companies have failed to invest in an adequate sewerage infrastructure, including treatment works.

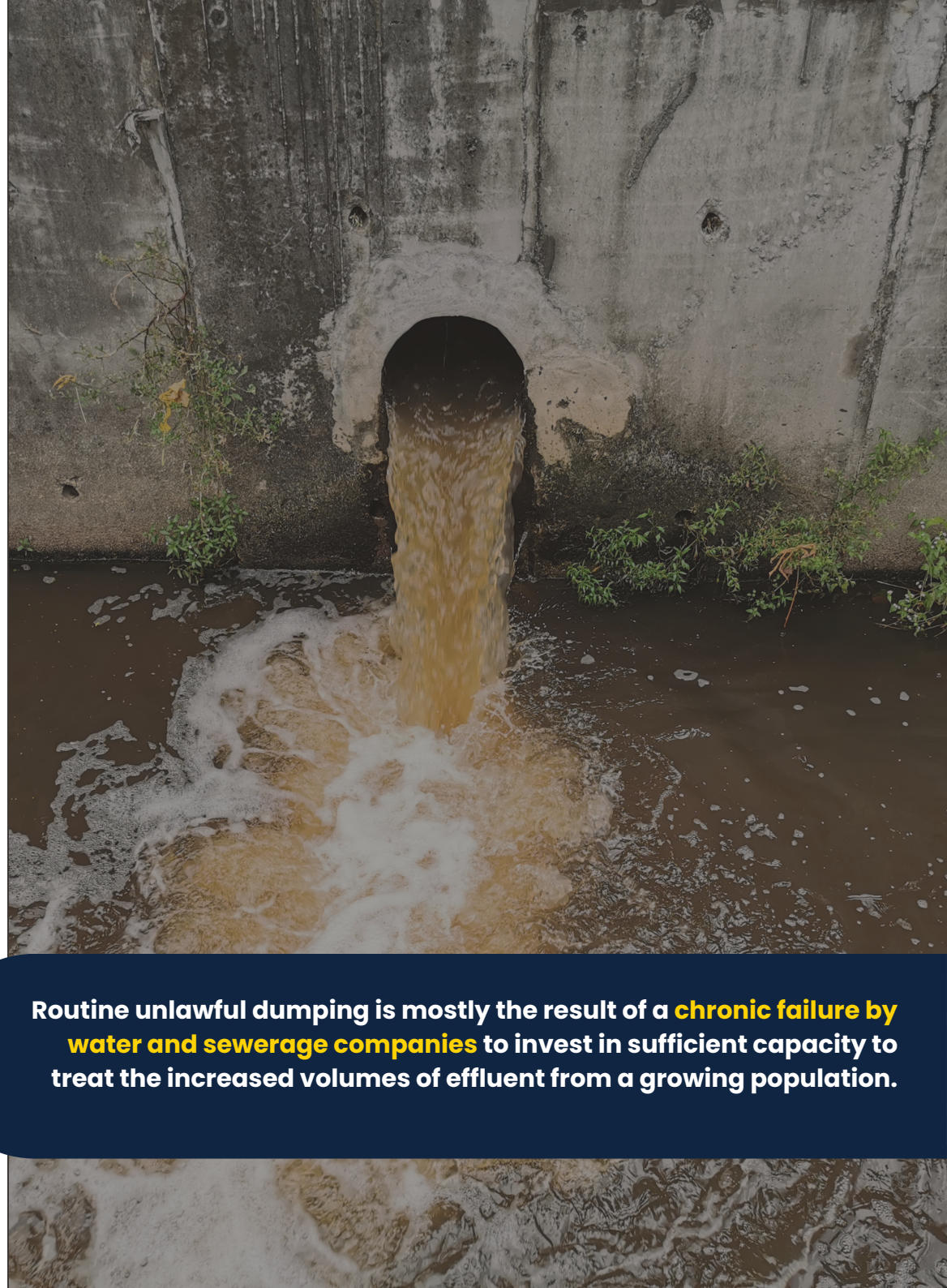
Discharges of raw sewage have marginally decreased in 2022 compared to 2021, but this is likely to have been due to lower-than-average rainfall for the UK in 2022, rather than by any significant action on behalf of the Government, regulators or by the water companies themselves.

Of course, the general increase in discharges of raw sewage from CSOs is not something which has taken us, or the water companies by surprise. It has been all too predictable.

We are well aware that the UK population started rapidly increasing in recent decades. More land has been developed. The current climate crisis was first identified in the 1950s and has been largely accepted as fact since the 1990s. Yet, water companies have failed to adapt and prepare in the face of these entirely predictable challenges. That is perhaps not altogether surprising for what are now private businesses concerned with increasing returns for investors. Building sewage capacity costs money. They have simply sought to maximise their returns in a lax regulatory system.

Since privatisation, the regulators, the Office of Water Services (OFWAT), the financial regulator of the water companies, and the Environment Agency (in England) and Natural Resources Wales (in Wales) have failed to use their statutory powers, and meet their statutory duties, to ensure sufficient investment has been made by the water companies to ensure that the routine sewage pollution we experience today was prevented.

OFWAT, the financial regulator, has particular questions to answer. **£1.4 billion was paid out in dividends to private water company share-holders in 2022, up from £520 million in 2021**. Increasing dividends means there is less money available from customer bills for investment in sewerage infrastructure such as sewage treatment works. Only one out of twelve private water companies in England and Wales generated a profit after tax in 2022, yet dividends increased by 180%. (Plimmer, 2023; Statista, 2022)



Routine unlawful dumping is mostly the result of a chronic failure by water and sewerage companies to invest in sufficient capacity to treat the increased volumes of effluent from a growing population.

2022

First formal complaint launched against sewage

WildFish made a formal complaint to the Office for Environmental Protection (OEP) which led to the announcement of its **first-ever investigation** into the regulation of combined sewer overflows.

2023

Court hearing takes place

WildFish challenged the Government's Storm Overflows Discharge Reduction Plan (the Plan) by way of **judicial review**.

2023

Legal judgement announced

The case confirmed that the infrastructure needed for the sewerage network to comply with the law **must be funded by the water companies and not by customers** through their water bills.

2024

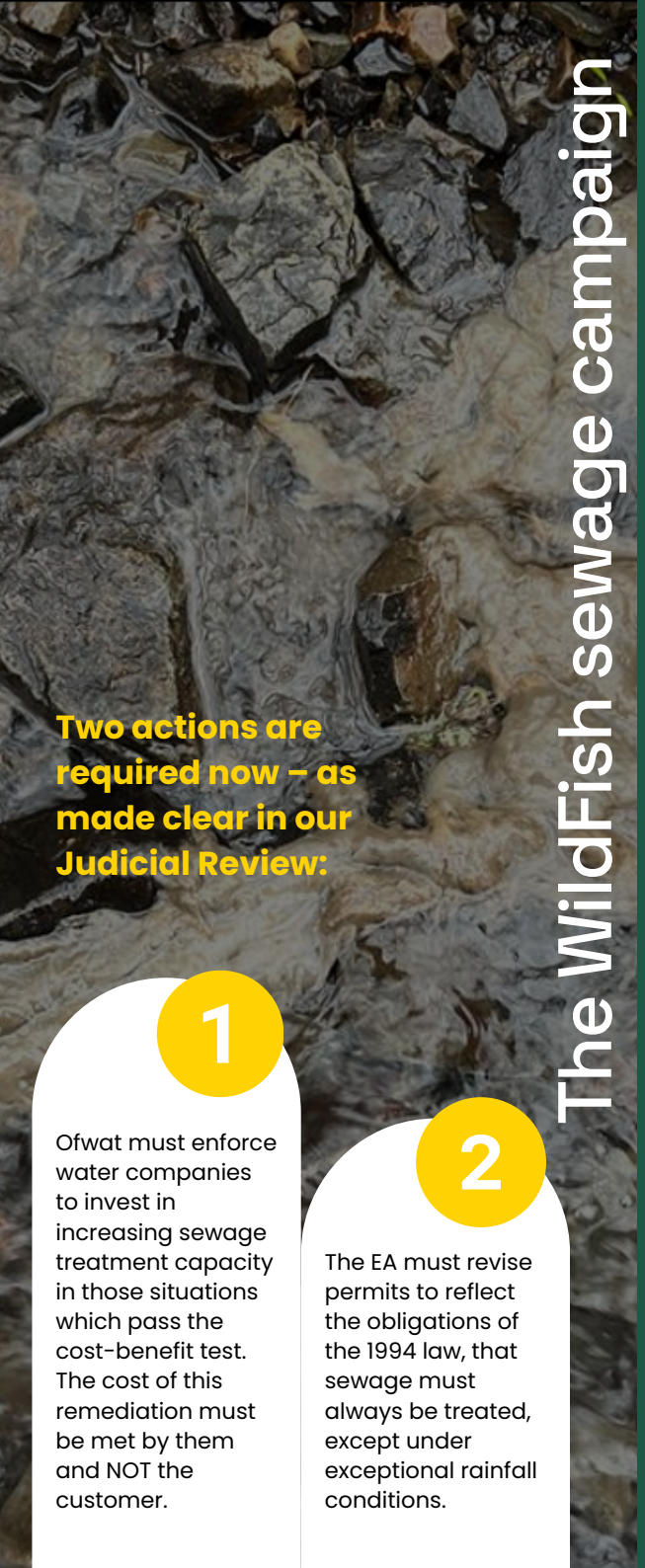
Continued legal action

WildFish recently sent formal legal letters to the Environment Agency and OFWAT.

If they do not fulfil their roles enforcing the law against water companies, a **further legal challenge** will likely follow from WildFish.

Campaign progress

The legal action WildFish have taken to protect rivers from sewage pollution.



The WildFish sewage campaign

Two actions are required now – as made clear in our Judicial Review:

1

Ofwat must enforce water companies to invest in increasing sewage treatment capacity in those situations which pass the cost-benefit test. The cost of this remediation must be met by them and NOT the customer.

2

The EA must revise permits to reflect the obligations of the 1994 law, that sewage must always be treated, except under exceptional rainfall conditions.

Judicial Review 2023

To try to force the changes we clearly need, we challenged the Government's Storm Overflows Discharge Reduction Plan by way of judicial review. We had concerns that the plan was ignoring existing law, was loading the cost of fixing the mess on customers and was stretching fixing the problem out over 25 years.

The judgement made clear that the Urban Waste Water Treatment Regulations 1994, which restricts the circumstances in which untreated sewage can be released into rivers via storm overflows, applies – and unlawful breaches under these regulations are not covered by the Government's Plan.

That 1994 law requires water companies to prevent untreated sewage being released (subject to site specific use of best techniques, not involving excessive cost), unless there is exceptional weather. Exceptional weather does not include normal or usual rainfall. It certainly does not include dry weather conditions, although we have seen many water company sewage pipes discharging untreated sewage into rivers in dry conditions over recent years.

The case confirmed that the sewage treatment infrastructure needed to comply with the 1994 law must be funded by the water companies and not by customers through their water bills.

Each year since privatisation the water companies have certified to OFWAT that they have sufficient funds to comply with their legal obligations – and that includes their obligations under the 1994 Regulations to treat sewage. They cannot now ask for more funds from bill-payers to build the sewage treatment works needed to end illegal discharges. Bill-payers have already provided those funds in previous years.

What's next

Following up on that case, WildFish has recently sent formal legal letters to the Environment Agency and OFWAT setting down exactly what the law requires them to do to end unlawful sewage discharges.

In parallel to the judicial review challenge, in 2022, WildFish made a formal complaint to the Office for Environmental Protection (the OEP) which led to the OEP's announcement of its first-ever investigation into the regulation of combined sewer overflows.

As part of that investigation, the OEP has already identified possible failures to comply with environmental law by DEFRA, the Environment Agency and OFWAT, stating that "we believe that there may have been failures to comply with environmental law by all three of the public authorities". The OEP's findings resonate with Mr Justice Holgate's judgement in the WildFish case.

WildFish believes it is now clear that OFWAT has a duty directly to enforce the 1994 law against water companies, which it has failed to do over decades and that it must now do that urgently. The Environment Agency also has a duty to secure compliance with the 1994 law by tightening the terms of the permits it issues to water companies under the Environmental Permitting Regulations 2016. The Agency must do that at once, as most permits issued by the Agency do not currently restrict raw sewage overflow discharges to exceptional weather.

If either of OFWAT or the Agency decide not to act, WildFish will actively consider further legal proceedings to force compliance with their legal duties to enforce the law on sewage against the water companies.

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Other information on WildFish work on sewage:

- https://wildfish.org/project/sewage-pollution/
- https://wildfish.org/latest-news/wildfish-puts-ofwat-and-the-environment-agency-on-notice/
- https://wildfish.org/latest-news/we-must-not-be-billed-twice-for-unlawful-sewage-pollution/
- https://wildfish.org/latest-news/the-impacts-of-pollution-on-english-rivers/
- https://wildfish.org/latest-news/water-company-announcement/
- https://wildfish.org/latest-news/2022-06-28-sewage-pollution-of-english-rivers/
- https://wildfish.org/latest-news/2022-sewage-discharge-data/
- https://wildfish.org/latest-news/wildfish-against-sewage/
- https://wildfish.org/wp-content/uploads/2023/09/WildFish_Judicial-Review_-Judgement.pdf
- https://wildfish.org/latest-news/sewage-friday-wildfish-high-court-judgement-clarifies-that-governments-storm-sewage-plan-does-not-deal-with-unlawful-discharges-of-untreated-sewage-into-rivers-and-seas/
- https://wildfish.org/latest-news/government-says-sewage-plan-does-not-deal-with-illegal-discharges-of-sewage-to-english-and-welsh-rivers/
- https://wildfish.org/latest-news/legal-challenge-from-wildfish-to-be-heard-in-the-high-court/
- https://wildfish.org/latest-news/sewage-pollution-campaign-update/

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