

2021 river basin management plans

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1. Summary

The vast majority of us live and work in urban areas, and most of us regularly travel by car, bus or train. Lakes, rivers, bathing waters and estuaries that lie within or close to urban areas are therefore an important asset to the people who live there. However, the level of pollution from towns, cities and transport that enters the water means that water bodies are failing to meet the water quality standards needed to support their wildlife and habitats. This decreases the environmental and recreational value of these water bodies.

2. The challenge of pollution from towns, cities and transport

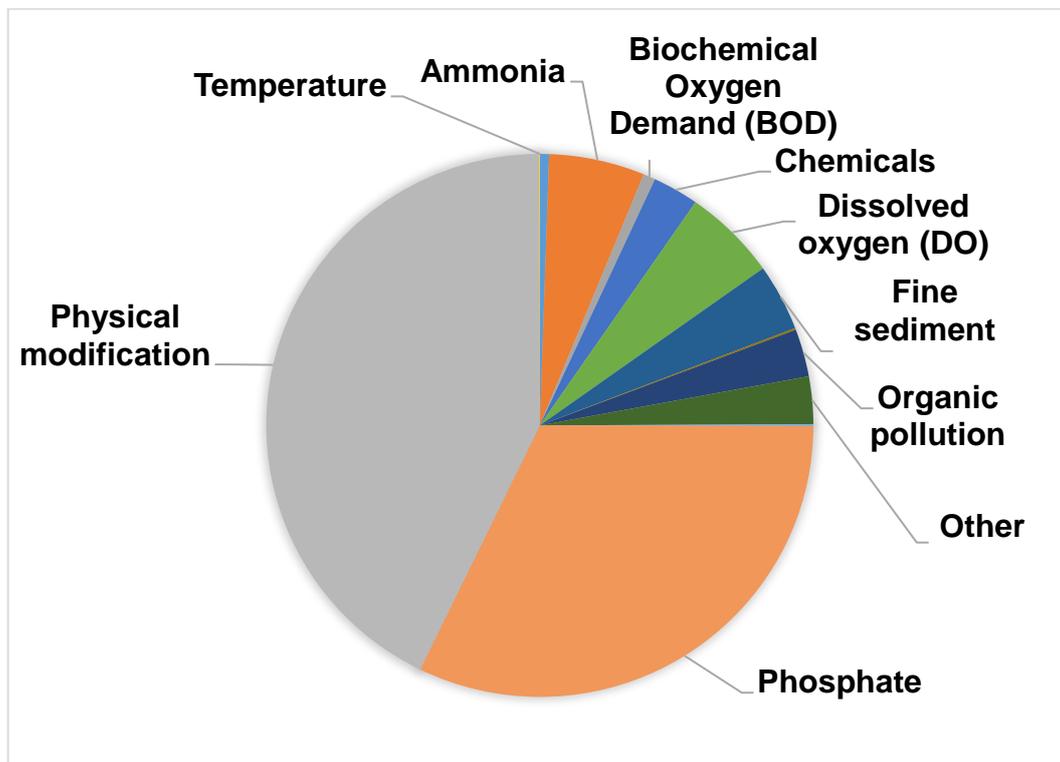
Urban areas and the transport network are a source of environmental contaminants, which include hydrocarbons, metals (including zinc, cadmium and copper), plastics, nutrients (including phosphate), ammonia, pathogens and sediment quantity and content (i.e. carrying solid pollutants). Such contaminants entering water bodies (rivers, streams, lakes) and groundwater have an adverse impact on water quality and ecology. Alongside this is the physical modification of water bodies, which also has an impact on the water environment.

In 2015, about 11 per cent of water bodies were identified as being damaged by pollution from towns, cities and transport. As of March 2019 this figure has risen to 18 per cent of water bodies in England numbering 879 out of a total of 4950 water bodies. This increase could be partly due to a combination of improved data accuracy and categorisation. However, it is clear that pressure on the water environment in towns and cities and from transport is increasing.

Principal sources of pollutants entering the water environment are drainage misconnections and urban runoff. It is not always easy to identify the source of this type of pollution or those responsible. This means using established approaches to controlling polluting activities such as through permits cannot as easily be applied because there may be more than one source of pollution. The pressures resulting from pollution from towns, cities and transport are likely to be made worse by climate change and population growth. In addition, ongoing increases in traffic volume has seen an increase in all motor vehicle traffic by 15 per cent in the last 20 years (Provisional Road Traffic Estimates Great Britain: April 2018 - March 2019, Department for Transport).

There are numerous urban and transport pressures that affect the water environment. Figure 1 shows which of these are having the biggest impact on water bodies in England not achieving good status.

Figure 1. Reason for not achieving good counts for each pressure against the 'Urban and Transport' sector category. This only includes water bodies and not protected area sites.



2.1 Urban run-off

Rain water that runs off roads, car parks, industrial areas, contaminated land, pavements and roofs carries pollutants into the water environment. These pollutants include a variety of chemicals, metals, plastics (micro and litter), oils and lubricants, sediment, nutrients and pathogens. 'First flush' events can have a significant effect on water quality. This is when intense rainfall following an extended dry period washes a large amount of contaminants from hard standing areas into local water bodies.

2.2 Misconnections and non-designed use of drainage systems

Misconnections are defined as part of a drainage system connected to the wrong receiving waste water network. An example is a toilet or home appliance pipe discharging to the surface water network. This results in inadequately treated effluent entering the environment.

The drainage system and its associated pipework serve a number of purposes within the urban environment and misconnections are a significant cause of pollution.

The number of households where there are sewerage network misconnections is unknown, but in 2010 it was believed to be around 300,000 across England and Wales (Supplementary written evidence submitted by OFWAT, Prepared 22 December 2010). In most cases this lead to pollutants entering watercourses and ground waters, having a detrimental impact on the environment and ecology. Alongside this is the potential for impacts on bathing and shellfish waters (including

pathogen content and excessive algal growth). Further information can be found in the faecal contamination document in the Challenges and Choices consultation.

The Environment Agency estimates that misconnections affect about 9 per cent of all bathing beaches and around 15 per cent of the kilometres of water covered by the Water Framework Directive, although the exact numbers and impact are difficult to establish because such impacts are cumulative and interrelated.

An example of overloaded waste water systems is when the sewerage system receives rain water during a storm event. This increases the likelihood of emergency discharges of polluted waters into rivers because the pipework is unable to cope with unusually high volumes. When surface water enters sewerage systems this can potentially cause sewer systems to overflow. This might increase the need for pumping, adding to treatment and energy use with additional costs.

Inappropriate disposal of domestic materials such as wet wipes, fat and sanitary products through the foul water network also causes overflow discharges and sewer failures. Thames Water identify this issue as the biggest cause of the 75,000 blockages it deals with in a year. Severn Trent Water states that 70 per cent of its 45,000 sewer blockages are due to us putting the wrong things down our sinks and toilets.

Commercial operations such as factories may discharge, process, or trade effluent through surface water drainage systems. Direct discharge is likely to pollute water bodies. For example, standalone commercial car washes can discharge polluting wash waters and detergents into local water bodies through surface water drains. Other activities and operations at industrial estates can contribute to urban diffuse pollution, including loading and unloading potentially polluting substances, incorrect storage of chemicals and heavy vehicle traffic.

2.3 Drainage network overflows and intermittent or uncontrolled discharges

Intermittent discharges of effluent in the drainage network generally occur in emergencies or as a result of an exceptional weather event. This includes both storm sewage overflows (discharges from storm tanks/facilities) and emergency overflows (due to mechanical or power failures). These discharges, although dilute, are almost always untreated discharges and so pose a risk to the environment, aesthetics and have potentially human health risks.

In addition to the above, combined sewerage networks carry both foul water and surface water to sewage treatment works. As part of this system combined sewerage overflows (CSOs) intermittently operate to discharge these waters when the system is unable to accommodate increased flows in the system. Discharges from CSOs often enter nearby water bodies, carrying untreated sewage and urban runoff. Leaking sewerage pipe work also pollutes the water environment, both surface and groundwater. Unregulated trade effluent discharges also occur which can flow directly into the environment without any treatment.

2.4 Transport – highways, railways, airports

The transport network covers long distances and affects both the urban environment and those rural areas it passes through. Runoff from the land near roads and facilities associated with transport all contain pollutants. These include spilled fuel, lubricants, metals, plastics and chemicals from the transport network. Serious pollution incidents can occur from accidents, spillages and incorrect or negligent usage of chemicals which result in pollutants entering water bodies and groundwater.

The total transport miles covered by vehicles in Great Britain is stated as 328.9 billion vehicle miles for the year ending March 2019 (an increase of 0.8 per cent over the previous year). Table 1 below sets out the percentage of total vehicle usage by road type for the period April 2018 to March 2019. Motorways, rural 'A' and rural minor roads have shown the largest increases in vehicle traffic over the last 20 years. This is a larger increase than that for urban 'A' and urban roads. (Provisional Road Traffic Estimates Great Britain: April 2018 to March 2019; Department for Transport 13 June 2019).

Table 1 Share of traffic by road type April 2018 to March 2019 as a percentage (Department for Transport)

Road Type	All vehicle traffic (per cent)
Rural 'A' roads	30.5
Motorways	20.8
Urban Minor roads	20
Urban 'A' Roads	15
Rural Minor Roads	13.7

Road network pollutants come from tyre and brake wear, exhaust emissions, oil and fuel deposits. All of these can and do enter the water environment. In addition it's believed that 68,000 tonnes of microplastics are generated from tyre wear in the UK every year of which 7,000 to 19,000 tonnes enter surface waters. Add to this between 1,400 and 3,700 tonnes of microplastics from paint on buildings and road markings (Source: 'Reducing Household Contributions to Marine Plastic Pollution' report 22 November 2018, Friends of the Earth). The principal route for these pollutants is through surface water runoff, and vast and unquantified number of drainage outfalls carrying road runoff.

Contamination also occurs from the runoff in winter of de-icing chemicals and salt used on roads and runways, plus herbicides used for weed control on the road and rail transport networks. Pollutants also enter water bodies and coastal areas directly from boats discharging sewage, washings, paints and chemicals used in maintenance, and from contaminated land as result of historic transport uses.

The 'Chemicals in the Water Environment' section of the Challenges and Choices consultation contains further information on chemicals.

3. Addressing the challenge

It is difficult to assess the exact scale, impact and apportionment of this range of sources of diffuse urban pollution. The reasons for this include:

- the complexity and nature of weather patterns
- drainage network types, operations, ownership and responsibilities
- variations in river systems
- land use (current and historic) over the relatively large footprint of England's urban areas

Urban diffuse pollution has many contributory sources as well as many cumulative impacts. Understanding the rate and variability of discharge volume and consequent pollutant load into water bodies is difficult. At present there is inadequate evidence and data on the causes of the problem although the impact is clear.

A multidisciplinary approach to the issues is required. By tackling the pollution sources affecting water bodies there are likely to be multiple benefits, for ecology, flood risk management and the amenity value of local places. The Environment Agency tackles the water pollution from towns, cities and transport in a number of ways.

3.1 Working with stakeholders

The numerous sources of water pollution from towns, cities and transport means that no one body or organisation is responsible for addressing the causes of this pollution. The Environment Agency is responsible for ensuring that water quality standards are met but its powers to influence urban and transport development and management are limited.

The Environment Agency is actively involved in a number of initiatives that address urban diffuse water pollution issues through working with partners. This includes promoting a catchment based approach such as the Irwell Catchment Pilot (in the North West of England and Greater Manchester), which is aiming to reduce urban sources of water pollution and includes having a strategy in place to reduce the impact of point and diffuse sources by 2027.

In addition the Environment Agency works with stakeholders, business communities and local people to address misconnections, improve drainage network issues and reduce pollution incidents. It works with Highways England on major road schemes classed as Nationally Significant Infrastructure Projects and invests in the water environment through the Government's Road Investment Strategy (RIS1) funding programme which runs from 2015 to 2021.

The Environment Agency also raises awareness of the need to plan, design and carry out the physical modification of water bodies to minimise the impact on the natural environment including water quality, habitat and ecology. This is done through a variety of ways including the consent process. This is a required part of flood risk operations activity and is also done through the spatial planning system.

3.2 Influencing spatial planning

The Government is committed to building more homes and helping to provide the infrastructure and jobs needed to tackle inequality and create prosperous places. Those places rely on a healthy environment.

Improving the environment within a generation, improving people's lives and dealing better with climate change drives everything the Environment Agency does. To do that, and increase certainty and pace to achieve sustainable growth, the Environment Agency looks for opportunities to shape strategic plans for development. This includes providing timely technical advice as a statutory consultee for development plans, planning applications, nationally significant infrastructure projects and other major development projects.

Our key role in planning, delivering and enabling infrastructure supports sustainable growth. This helps to ensure people and the environment are protected, and development is resilient to climate change. Working with Local Authorities, Local Enterprise Partnerships, developers and government and other partners, the Environment Agency encourages timely planning and infrastructure building.

By investing in green infrastructure, new development can avoid adverse impacts on the water environment. Seeking betterment, for example through reducing the risk of flooding, remediating contaminated land and reducing pollution also improves the environment. Contributions from developers can help achieve environmental benefits such as flood risk infrastructure.

Productive places rely on a healthy environment to provide the water we drink, the air we breathe and the land on which we live, work and relax. Enhancing this natural capital through investment to improve local places is essential for productivity, inward investment, resilience to climate change and improving health and wellbeing. The government's 25 Year Environment Plan highlights the link between personal wealth and local environment. This is measured by proximity of homes to sources of high pollution such as roads, or conversely homes with access to green space.

Effective alignment of funding and investment achieves multiple benefits for the environment, people and wildlife. The Environment Agency, working in partnership, can attract and direct investment in local places through its role as operator, regulator and advisor. It can seek opportunities to shape strategic plans for growth and influence investment into improving the environment. This can be done by working with local enterprise partnerships (LEPs), local and combined authorities and other partners on their strategic plans for growth and investment.

3.3 Addressing drainage issues and misconnections

The Environment Agency continues to work with stakeholders including water companies and local authorities to tackle misconnection issues. It supports the multi-organisational 'ConnectRight' initiative which is aimed at builders and homeowners. It looks to tackle misconnection issues as a preventative approach to protecting the water environment.

In addition to the above the Environment Agency promotes the development of drainage and waste water management plans (DWMPs) by water companies in England. From 2023 these plans will bring together the planning of waste water,

urban diffuse pollution and resilience in a strategic and integrated approach to the drainage network.

The incorrect usage of drains is tackled by the Yellow Fish scheme, which is run by the Oil Care campaign. This aims to raise awareness of polluting substances, including oil, paints and cleaning chemicals being disposed of via drains and damaging water quality and habitats in local rivers, lakes, ponds and coastal areas. The scheme involves marking drains with a Yellow Fish icon to raise awareness of the issue and change behaviours.

In providing a strategic overview of flood risk issues in England, the Environment Agency promotes sustainable drainage systems (SuDS) to manage flood risk. These also have an important role in managing surface water runoff. As well as helping to reduce the causes and impacts of flooding, SuDS can also provide additional benefits such as removing pollutants from urban runoff and combining water management with green space that offers scope for community recreation and wildlife habitat as well as reducing urban overheating. The National Planning Policy Framework (NPPF) states that “major developments should incorporate sustainable drainage systems, unless there is clear evidence that this would be inappropriate”. Planning policy also requires all development in areas at risk of flooding to incorporate SuDs, unless there is clear evidence that they would be inappropriate. Lead local flood authorities (LLFA) are responsible for advice on SuDs locally.

4. Future challenges, actions and choices

Good progress has been made in elements of addressing water pollution from towns, cities and transport across different organisations. It would be beneficial to crystallise the principal elements of these good examples into a strategy and action plan, providing clarity on roles and responsibilities, sharing best practices and highlighting approaches to tackle the issues associated with urban diffuse pollution.

A strategic, partnership approach is required to better understand and address the broader urban diffuse pollution issue, particularly at the catchment scale. There is a need to improve knowledge and awareness of the issues, foster behavioural change, encourage targeted investment and promote the correct action from public and private sectors. This approach will benefit the environment and the economic health and value of communities.

5. Choices

Question 1: What can be done to address pollution from towns, cities and transport?

Question 2: How can sustainable drainage systems and green infrastructure be most effectively used to tackle pollution from urban areas? What challenges are there to using them?

6. Contacts

If you have any feedback or comments on the evidence contained in the summary then please contact:

enquiries@environment-agency.gov.uk

7. References

- Provisional Road Traffic Estimates Great Britain: April 2018 - March 2019; Department for Transport 13 June 2019 <http://www.connectright.org.uk/> (June 2019)
- 'Reducing Household Contributions to Marine Plastic Pollution' report (Friends of the Earth, 22nd November 2018)
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- <https://www.thameswater.co.uk/be-water-smart/Bin-it/whats-blocking-the-drains> - What's blocking the drains? (Thames Water web-site 2019)
- <https://www.stwater.co.uk/my-supply/waste-water/looking-after-your-sewers/avoiding-blockages/> How to avoid nasty blockages, Severn Trent Water web-site 2019.