

**Paper 2: Urban Diffuse Pollution - National Issues & MURCI Waters Case Studies****Author: John Brewington, Programme Manager, Environment Agency** **07801 348981** **john.brewington@environment-agency.gov.uk****Abstract:**

This paper outlines the various sources of urban diffuse pollution and details their significance for urban watercourses in the Midlands. It will also highlight some of the challenges faced when tackling diffuse sources in complex catchments.

Finally the paper will introduce some of the measures being delivered as part of the Environment Agency's MURCI Waters programme.

**Introduction:**

Urban diffuse pollution damages canals, rivers and lakes especially in towns and cities where a healthy natural environment can make significant improvements to the quality of life and help drive economic growth and prosperity. Reduction of urban diffuse pollution also presents a significant challenge as we work to meet Water Framework Directive (WFD) targets.

**Urban Diffuse Pollution – the national picture:**

In England, just 27% of water bodies meet the Good Ecological Status (GES) standard under the WFD classification system. It is a priority for Defra and the Environment Agency to improve this situation by managing water resources, naturalising man-made channels and reducing the discharge of pollutants. Despite decades of investment and significant water quality improvements, pollutants still present a considerable challenge, with many reaching the water environment from diffuse sources.

*Diffuse pollution* is defined<sup>1</sup> as unplanned and unlicensed pollution from farming, old mine workings, homes and roads. It includes urban and rural activity and arises from industry, commerce, agriculture and civil functions. Diffuse pollution can then be split into 2 categories: agricultural diffuse pollution and non-agricultural or urban diffuse pollution. The latter occurs mainly (but not solely) in towns and cities.

In highly urbanised areas the contribution of urban diffuse pollution towards the total number of WFD failures is substantial, with over 1000 water bodies facing a significant urban diffuse pollution problem. For example, in the heavily urbanised Thames river basin, road runoff accounts for the majority of WFD failures. In 2011 urban diffuse pollution accounted for the major cause of 23 bathing water failures.

Historically diffuse pollution has been given a lower priority compared to discharges from point sources associated with the sewerage network, sewage treatment and industry. This has in part been due to the complexities around the root causes of diffuse pollution and a lack of evidence around the cost and effectiveness of interventions. It is also much more difficult to identify who is responsible for diffuse pollution and which party should act to improve the situation.

The sources of urban diffuse pollution are numerous and they often discharge into complex and heavily engineered catchments. The following sources have been ranked in terms of their relative significance by consultees to Defra's *Tackling water pollution from the urban environment*<sup>1</sup> consultation document.

- Urban runoff including from highways
- Misconnections - discharge of foul sewage to surface water sewers and vice versa.
- Trading (light industrial) estates
- Abuse of drainage systems
- Septic tanks & non-mains sewage systems
- In-situ contaminated river bed sediment
- Contaminated land
- Mine waters from abandoned metal mines
- Pesticides and fertilisers i.e. from roads, parks and recreation areas.
- Mine waters from abandoned coal mines
- Transient commercial car washing
- Rural road runoff
- Airports
- Railways
- Discharges from boats and other craft

Due to the nature and diversity of root causes, a range of measures are required to address urban diffuse pollution. Education and engagement campaigns, retrofit sustainable drainage solutions and remediation of contamination will all play a significant role. It is also particularly important that we break the cycle of poor water quality and hidden (culverted) or unsightly river channels leading to a community's indifference to their local urban watercourses.

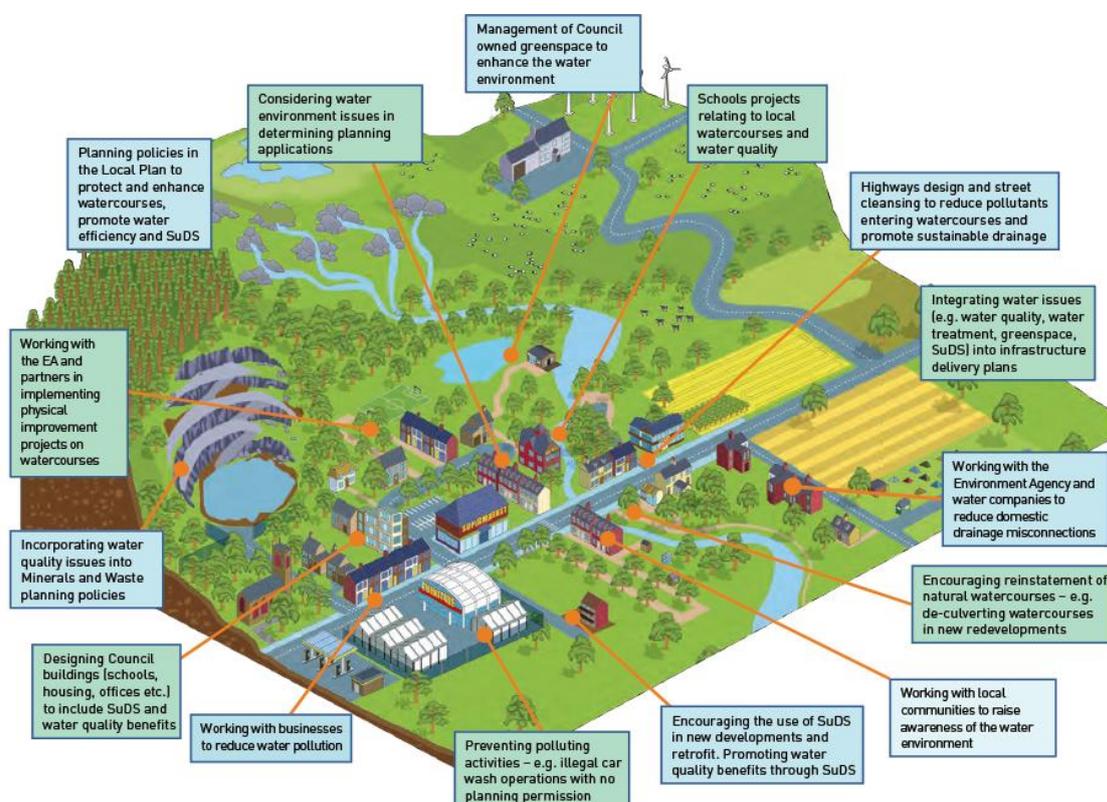


Figure 1. Suggested Local Authority actions to improve urban watercourses. Taken from Environment Agency and Sustainability West Midland's *Advice Note on the Water Framework Directive*<sup>2</sup>.

Previous work (e.g. Mayes brook restoration<sup>3</sup>) shows that enhancing urban watercourses provides benefits in terms of well-being and economic development. The Government has therefore committed to dealing with urban diffuse pollution in the Natural Environment White Paper<sup>4</sup>. Specifically commitment 27 states that Defra will develop a strategy to identify and address the most significant diffuse sources of water pollution from non-agricultural sources. Defra consulted on the plan in November 2012 and the strategy is currently in development.

**Urban Diffuse Pollution – the picture from the Midlands:**

Following an extensive period of water body investigations in the Midlands, we have identified 238 water bodies where urban diffuse pollution has been attributed as a Reason for Failure. Urban diffuse pollution accounts for 14% of reasons for failure in all failing water bodies.

Figure 2. WFD Reasons for Failure in the Midlands

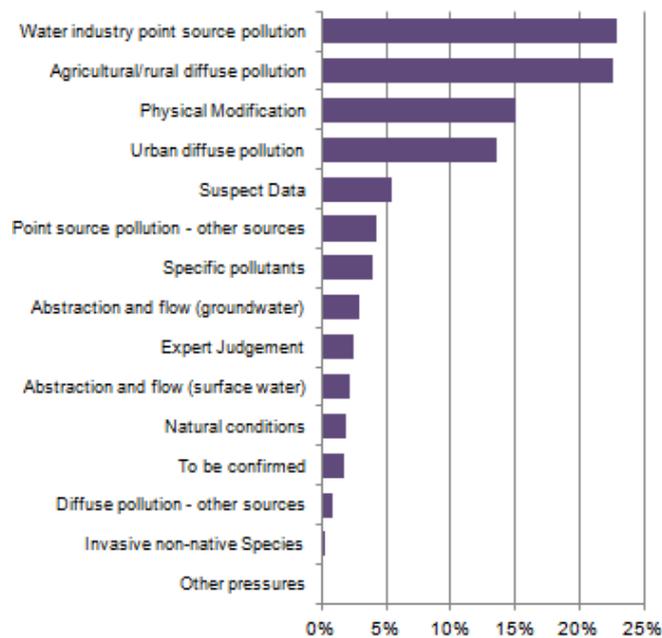
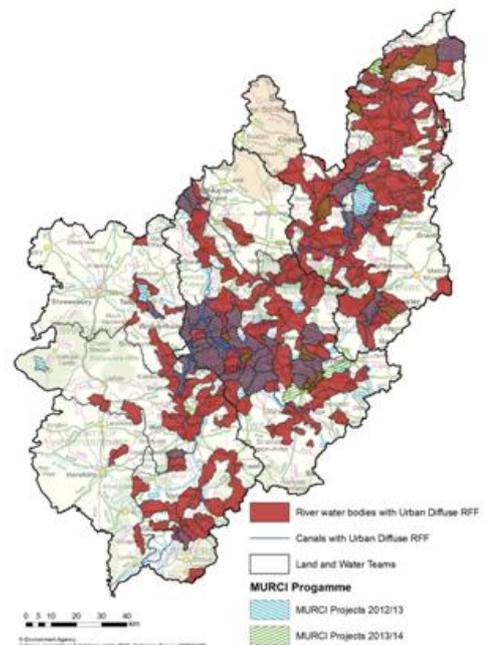


Figure 3. WFD Water bodies with urban diffuse pollution as a RFF.



We've also identified failing elements for water bodies and found that just three (phosphate, invertebrates and ammonia) account for 76% of failures due to urban diffuse pollution.

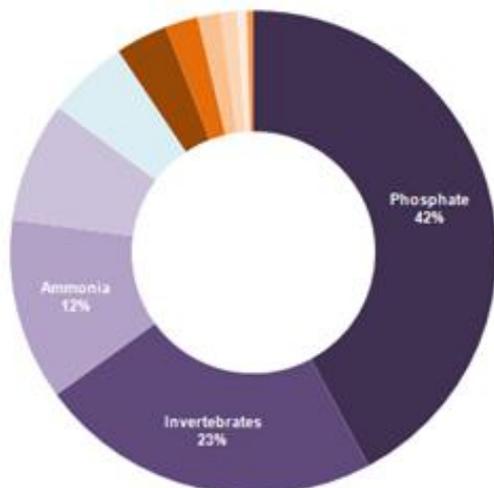


Figure 4. Failing elements due to urban diffuse pollution



## Midlands Urban Rivers Community Initiative:

The Environment Agency's MURCI Waters programme is tackling the root causes and behaviours that lead to diffuse pollution. The programme was commenced to address the fact that urban diffuse pollution and heavily modified water bodies present a significant challenge under WFD and contribute to environmental deprivation in many urban areas. All MURCI Waters projects share a common focus on partnership working and community engagement.

Figure 5. Example MURCI Waters projects

	<p><b>WatersideCare</b> is our partnership with Keep Britain Tidy, Severn Trent Water and the Canal &amp; River Trust. The initiative helps communities protect and improve their local canals, brooks and rivers through conservation work, litter collection, community education and biological surveys. There are currently 27 WatersideCare groups across the Midlands, from Birmingham to Scunthorpe.</p>
<p><b>Platt Brook Restoration.</b> This project forms part of our ongoing Birmingham Brooks Partnership with Birmingham City Council.</p> <p>1.2 km of degraded brook was restored or enhanced to provide an improved habitat and water environment for the local community. Adoption of the restored watercourse by a local community group will help secure a strong legacy.</p>	
	<p><b>Freshwater Invertebrate Network</b> is our partnership with Birmingham and Black Country's EcoRecord. FIN is the urban equivalent of the River Fly programme. There are currently 11 FIN groups who are monitoring 17 sample points in order to monitor water quality and stream health. The partnership is also developing a web based training and reporting tool for FIN groups and hopes to expand across the country.</p>
<p><b>Love your River Coventry.</b> In Coventry we're working with Warwickshire Wildlife Trust to help communities improve their local watercourses. We're highlighting the impact of sewer misuse and helping prevent misconnections. We've also identified a range of improvements to enhance the look and biodiversity of watercourses and to introduce sustainable drainage within the wider catchment.</p>	

Of particular interest to the Urban Drainage Group is the Day brook rain garden project. This partnership project between the Environment Agency, Groundwork Greater Nottingham, Nottingham City Council and Severn Trent Water has delivered 21 retrofit rain gardens in a residential street in Nottingham.

Figure 6. Day brook rain gardens.



We are continuing to evaluate the effectiveness and public acceptance of the rain gardens. For further information on this project please see the [Susdrain case study](#).

#### References:

- 1 Defra. *Tackling water pollution from the urban environment. Consultation on a strategy to address diffuse water pollution from the built environment*. November 2012. Download [here](#).
- 2 Environment Agency and Sustainability West Midlands. *Local Authority Services and the Water Environment. Advice Note on the Water Framework Directive for Local Authorities across the Midlands*. June 2012. Download [here](#).
- 3 Everard, Shuker and Gurnell. *The Mayes Brook restoration in Mayesbrook Park, East London: an ecosystem services assessment*. April 2011. Download [here](#).
- 4 HM Government. *Natural Environment White Paper*. June 2011. Download [here](#).
- 5 All regional WFD data and associated figures are taken from the Environment Agency Midlands Region Land and Water Evidence Pack 2013.