

# Environmental Audit Committee Inquiry: Water quality in rivers

## Response by the Zoological Society of London - February 2021

The Zoological Society of London (ZSL) welcomes the opportunity to provide written evidence to the Environmental Audit Committee (EAC) inquiry into water quality in rivers.

### Introduction

ZSL is an international conservation charity working to create a world where wildlife thrives. From investigating the health threats facing animals to helping people and wildlife live alongside each other, ZSL is committed to bringing wildlife back from the brink of extinction. Our work is realised through our ground-breaking science, our field conservation around the world and engaging millions of people through our two zoos, ZSL London Zoo and ZSL Whipsnade Zoo. For more information, visit [www.zsl.org](http://www.zsl.org).

ZSL's Marine and Freshwater Conservation Programme was established in 2005 with the goal of delivering effective conservation that informs, inspires and empowers people to drive the mass recovery of aquatic wildlife. UK rivers, particularly in urban environments, form a key component of this programme. Our strategic aims for rivers are:

- **Clean water** - Water quality in rivers is consistently good enough to allow them to reach their wildlife potential.
- **Abundant life** - Habitats critical for the ecological functioning of rivers are identified and protected and, where degraded or lost, restored.
- **Connected people** - An active community of informed river champions is developed through citizen science volunteering and delivered nationally through partnership working.

In 2016, ZSL and partners (Forum for the Future, Communications In and Thames Estuary Partnership) launched the [#OneLess project](#), which is working to tackle ocean plastic pollution by reducing the amount of single-use plastic water bottles used in London.<sup>1</sup> London is linked to the ocean by the River Thames, and the daily actions that citizens take in London impact upon both the river, and the ocean. #OneLess is working to create systemic change, transforming London into a place where polluting single-use bottled water is a thing of the past and where plastic waste is drastically reduced for the sake of the ocean.

### Response to inquiry questions

#### 1. What are the best indicators for river water quality that could be used as targets being developed under the Environment Bill?

1.1 ZSL considers the best indicators for river water quality that could be used as targets, being developed under the Environment Bill include:

- Ammonium concentrations as NH<sub>4</sub>-N
- Total phosphorus
- Polyaromatic hydrocarbons (in water and river sediment)

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<sup>1</sup> <https://www.onelessbottle.org/>

1.2 **Potentially harmful chemicals** - Research is needed to understand the impact that chemicals and combinations of chemicals are having on rivers. Monitoring for potentially harmful chemicals must include a systematic regime of regular sampling at multiple sites and the samples subjected to broad spectrum chemical analysis.

1.3 **Continuous monitoring** - The use of multiparameter continuous monitoring sensors should be considered over 'spot sampling' for monitoring water quality. Continuous monitoring over just a few days can provide clearer understanding of the river quality than can be obtained by many years of spot sampling. Wet weather condition monitoring is most useful as water quality deterioration during times of wet weather is likely to be the most critical factor which determines the ecological status of the river.

## **2. How could drainage and sewage management plans, introduced by the Environment Bill, play a role in reduced sewer discharges?**

2.1 If developed well, the Drainage and Wastewater Management Plans (DWMPs) could lead to an audit of the condition of sewer infrastructure and detailed long-term planning of infrastructure repair and upgrade that will reduce pollution and make sewage infrastructure fit for purpose into the future. It is essential that the development of DWMPs is based on actual discharges from sewer networks to rivers, rather than the modelled discharges which are currently being conducted by water companies. The assessment of current discharges will require:

- Accurate monitoring of the frequency of Combined Sewer Overflow (CSO) discharge and pollutant load in the discharge.
- Gathering of data on water quality in rivers during low and high flow conditions.
- Surveys of sewer networks to identify and monitor non permitted sewage discharge points and faulty infrastructure.

2.2 OFWAT will need to accommodate the uplift in investment required to support the delivery of DWMPs in future Asset Management Periods. In our view the DWMPs can become an important means by which water companies reduce pollution and plan the development of sewage infrastructure to accommodate future demands. We urge that they become a statutory duty for water companies during the next Asset Management Period.

## **3. How adequate are the monitoring and reporting requirements around water company discharges? How can technology improve and assist with transparency and enforcement?**

### **3.1 Permitted discharges**

As a minimum, standard practice monitoring at permitted discharges should include:

- Permitted discharges at sewage works should include monitoring upstream and downstream using multiparameter continuous monitoring sensors.
- Combined Sewer Overflows (CSO) should all by now have Event Duration Monitoring (EDM) on. Thames Water has EDM on its permitted CSOs but has told us, "*It is important to emphasise that we're monitoring all permitted CSOs, as we potentially have an unknown number of CSOs in the*

*network that are unpermitted and unmonitored. There is a programme in place to investigate these and eventually get them permitted and monitored if appropriate. This may however take time to trace, monitor and obtain those consents.”*

This is a water company whose aspiration is to cause zero pollution, so it begs the question, given their potential impact on the environment, how is it that they are unaware of where all their CSOs are?

### 3.2 Non-permitted discharges

A proportion of sewage in London’s river appears to be from non-permitted discharge points such as cross connections, poorly designed infrastructure such as dual manholes, and blockages that cause foul waste to back up and find the nearest route to a river via the surface water sewer network.

3.3 For example, a study by ZSL on the Frogs Ditch, a small tributary of the River Crane in West London, in December 2020 recorded peaks of Ammoniacal Nitrogen concentrations of between 2 and 6 mg/l after rainfall events. The way the Ammoniacal Nitrogen concentrations manifest after rainfall is typical of point source discharge such as polluted surface water outfalls and/or CSO discharging into watercourses (report in progress).

3.4 Spot sampling in the Harrow section of the River Crane over six years, as part of The Citizen Crane project, shows annual median Ammoniacal Nitrogen concentrations of between 0.33 and 2.78 mg/l.<sup>2</sup> The Water Framework Directive (Priority Substances and Classification) Regulations for ‘Total Ammonia’ in freshwater systems range from 0.2mg/l indicating ‘High’ quality and concentrations >2.25mg/l indicating ‘Poor’ quality.<sup>3</sup>

3.5 Proactive surveying for non-permitted discharges and misconnections should be mandatory in all regions. This can be done using ‘Outfall Safari’, a citizen science method for surveying outfalls in urban river catchments, or similar systematic survey method. Outfall Safaris in Greater London from 2016 to present have surveyed 249km of river and assessed 1,902 outfalls. Of the outfalls assessed, 379 showed signs of pollution significant enough to warrant follow up by the water company. This equates to one polluting outfall per 0.66 km of river in London.<sup>4</sup> It is probable that a similar prevalence of polluting surface water outfalls exists in other urban areas in the UK with a dual drainage system.

3.6 The following figures on the percentage of properties that are misconnected (polluting rivers) are:<sup>5</sup>

- 3% misconnection rate has been reported from site investigations in the London region by Thames Water.<sup>6,7</sup>

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<sup>2</sup> Citizen Crane 2019/20 Year Six Report. (Available from [http://www.cranevalley.org.uk/documents/CC\\_Yr6\\_Report\\_04112020.pdf](http://www.cranevalley.org.uk/documents/CC_Yr6_Report_04112020.pdf)).

<sup>3</sup> Water Framework Directive (2011). (Available from <https://www.legislation.gov.uk/ukxi/2017/407/contents/made>).

<sup>4</sup> Tackling Pollution in London’s Rivers (2017). (Available from [https://www.zsl.org/sites/default/files/media/2017-12/1710\\_CP\\_OutfallReport\\_Final.pdf](https://www.zsl.org/sites/default/files/media/2017-12/1710_CP_OutfallReport_Final.pdf)).

<sup>5</sup> Ellis, J.B., & Butler, D., (2015) Surface water sewer misconnections in England and Wales: pollution sources and impacts. *Sci. Total Environ.* 526, 98-109. (Available from <https://eprints.mdx.ac.uk/15702/>).

<sup>6</sup> Dunk, M.J., McMath, S.M., Arikans, J., (2008) A new management approach for the remediation of polluted surface water outfalls to improve river water quality. *Water Environ. J.* 22, 32–41.

<sup>7</sup> Mills, P., (2010) Misconnections matter. *Resid. Prop. J.* 2010, 18–19.

- Surveys of 936 residential properties in the River Clyne catchment in the Dunvant district of Swansea, South Wales confirmed a 4% misconnection rate.<sup>8</sup>
- Field tracer and CCTV surveys of 2,602 households in the Tolka Valley district of northern Dublin, Ireland recorded an average 6% misconnection rate which has been confirmed by studies undertaken elsewhere in the city.<sup>9</sup>

#### 4. What is the impact of plastic pollution and other materials on drainage and water quality in rivers and what should be done to mitigate it?

##### Impact

##### 4.1 Rivers provide a major pathway for plastics to the ocean:

- Rivers connect most of the global land surface to the marine environment and are known to play a key role in transporting land-based plastic litter into the ocean, as they ultimately discharge into the marine environment.<sup>10</sup>
- It is estimated that between 1.15 and 2.41 million tonnes of plastic currently flows from the global riverine system into the ocean every year, meaning that at least 2.8–18.6% of the coastal plastic emissions occur via river transport.<sup>11</sup>
- Evidence of plastic pollution has been found in many UK rivers, although the Thames is often found to contain some of the highest levels of plastic pollution.<sup>12</sup> The highest mean number of plastic items per  $^{-1} \text{ min}^{-1} \text{ person}^{-1}$  was recorded in the Thames Estuary and Marshes.<sup>13</sup> Microplastic levels recorded within the Thames water column per  $\text{m}^3$  were comparable to some of the highest recorded in the world.<sup>14</sup>
- Estuaries are hotspots for microplastic accumulation.<sup>15</sup>

##### 4.2 Impacts on biodiversity and human health:

- Via the Sustainable Development Goals (SDGs), the Member States of the United Nations (which includes the UK), have recognised the threat of pollution to ocean ecosystems, and have committed the following under SDG14:

*“By 2015, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.”<sup>16</sup>*

<sup>8</sup> King, D., Hayes, K., Evans, E., Rabaiotti, P., Colman, R., (2013) Drainage Survey for Misconnections: Clyne River (Swansea City & County, Swansea, South Wales, UK).

<sup>9</sup> Collins, J., & McEntee, D., (2007) A constructed wetland for the removal of urban pollution in the Finglaswood stream, Tolka Valley Park, Dublin. Proc. Int. Conf. Multiple Functions of Wetland Systems, pp. 1–11 (26–29 June 2007. Padova, Italy).

<sup>10</sup> Schmidt, C., Krauth, T., & Wagner, S., (2017) Export of Plastic Debris by Rivers into the Sea. Environ. Sci. Technol. 51, 12246-12253.

<sup>11</sup> Lebreton, L. C. M. et al. (2017) River plastic emissions to the world’s oceans, Nature Communications, 8, 1-10.

<sup>12</sup> Greenpeace. (2019) Upstream: Microplastics in Rivers.

<sup>13</sup> Nelms, S. E. et al., (2017) Marine anthropogenic litter on British beaches: A 10-year nationwide assessment using citizen science data. Science of the Total Environment. 579, 1399-1409.

<sup>14</sup> Rowley, K. H. et al., (2020) London’s river of plastic: High levels of microplastics in the Thames water column, Science of the Total Environment. 740, 140018.

<sup>15</sup> Browne, M. A., Galloway, T. S. & Thompson, R. C. (2010) Spatial patterns of plastic debris along estuarine shorelines. Environmental Science and Technology. 44, 3404-3409.

<sup>16</sup> Available from <https://sustainabledevelopment.un.org/sdg14>

- Plastic pollution poses a serious threat to marine and freshwater biodiversity, and places added pressure on ecosystems that are already stressed by the impact of human activity.<sup>17,18,19,20</sup>
- Previous studies have found evidence of ingestion by some Thames fish species such as European smelt, flounder, and roach.<sup>21,22</sup>
- Plastic debris is unsightly, it has the capacity to transport invasive species and potentially harmful chemicals, and it can represent a threat to human health.<sup>23</sup>

#### 4.3 Evidence from the #OneLess project:

Through the #OneLess project, ZSL coordinates the Thames Bottle Monitoring Programme. This standardised programme, which started in April 2016, is designed to complement, inform and extend the existing work being carried out on the Thames, and to provide a model that can be replicated nationally. It aims to determine and monitor over time the total levels of single-use plastic bottles in the Thames, as well as identifying sources, pathways, and fate of plastic litter in the Thames. This includes strandline and foreshore surveys with project partners at Thames21. Results of the Thames Bottle Monitoring Programme to date include:

- Between 2016 – 2020 volunteers collected **125,000 single-use plastic bottles during 1,297 surveys along the Thames foreshore – of which 43% were water bottles** (#OneLess unpublished data).<sup>24</sup>
- Plastic bottle abundance, including single-use plastic water bottles, declined significantly between 2016 – 2020 across six monitoring sites that have been surveyed on a fortnightly basis. However, the proportion of plastic bottles that were water bottles remained constant.<sup>25</sup>
- There were site-specific differences in both abundance and trends in bottle numbers across the six monitoring sites between 2016 – 2020. The monitoring site in the City of London has recorded the highest density of plastic bottles per m<sup>2</sup> compared to monitoring sites in Hammersmith and Fulham, Wandsworth and Greenwich.<sup>26</sup>
- Monitoring work carried out by #OneLess and Thames21 has shown that **10% of Thames shoreline litter collected is plastic drink bottles and lids, and half of those are water bottles**.<sup>27</sup>
- **Plastic drink bottles account for 25% of the litter picked up by floating passive debris collectors on the River Thames**.<sup>28</sup>

<sup>17</sup> Derraik, J. G. B. (2002) The pollution of the marine environment by plastic debris: A review. *Marine Pollution Bulletin*, 44, 842-852.

<sup>18</sup> Gall, S. C. & Thompson, R. C. (2015) The impact of debris on marine life. *Marine Pollution Bulletin*, 92, 170-179.

<sup>19</sup> Bellasi, A., Binda, G., Pozzi, A., Galafassi, S., Volta, P., & Bettinetti, R. (2020). Microplastic contamination in freshwater environments: A review, focusing on interactions with sediments and benthic organisms. *Environments*, 7, 30.

<sup>20</sup> Blettler, M.C.M., Wantzen, K.M. (2019) Threats Underestimated in Freshwater Plastic Pollution: Mini-Review. *Water Air Soil Pollut* 230, 174.

<sup>21</sup> McGoran, A. R. et al., (2018) Ingestion of plastic by fish: A comparison of Thames Estuary and Firth of Clyde populations. *Marine Pollution Bulletin*, 137, 12-23.

<sup>22</sup> McGoran, A. R., Clark, P. F. & Morrill, D. (2017) Presence of microplastic in the digestive tracts of European flounder, *Platichthys flesus*, and European smelt, *Osmerus eperlanus*, from the River Thames. *Environmental Pollution*, 220, 744-751.

<sup>23</sup> Ibid - Gall, S. C. & Thompson, R. C. (2015).

<sup>24</sup> #OneLess and Thames21. Thames foreshore bottle count data (2019 – 2020).

<sup>25</sup> Chamberlain, A. et al., (2021) Single-use plastic bottle pollution in the River Thames; abundance, composition and changing trends. Manuscript in preparation.

<sup>26</sup> Ibid - Chamberlain, A. et al., (2021).

<sup>27</sup> Thames21. (2020) Plastic Pollution in the Tidal Thames.

<sup>28</sup> Port of London Authority. (2017) pers. comm., unpublished data.

## Mitigation

4.4 First and foremost, plastic pollution in rivers needs to be addressed at source. Reliance on recycling is not good enough; recycling rates in the UK remain low (<50%),<sup>29</sup> meaning that efforts need to focus on reduction and reuse. Through our #OneLess project, we focus on using bottled water as an 'icon' for unnecessary single-use plastic. In the UK, where we have clean and safe drinking water available out of the tap, it is shameful that we use and dispose of billions of plastic bottles of water every year; many of which, as we have documented, end up in our rivers.

### 4.5 *Research*

An evidence gap remains in understanding pathways of single-use bottles into, along, and out of rivers. #OneLess is currently working with the engineering consultancy HR Wallingford to investigate and produce a model that can help determine the distribution, movement, and fate of plastic bottles in the Thames estuary. Due to be published in March 2021, this model can be shared with the EAC if helpful to this inquiry.

### 4.6 *Producer responsibility*

To date, not enough responsibility has been placed with the industries and manufacturers responsible for producing, selling, and using single-use plastic. In particular, our focus has been on single-use plastic water bottles, of which the UK uses some 7.7 billion annually.<sup>30</sup> This unsustainable use of plastic must change; and the bottled water companies, producers and major retailers must play a part in the necessary change.

4.7 The 10 major UK supermarkets reported that 2.5 billion branded and own-brand single-use plastic water bottles were sold or given away in 2019.<sup>31</sup> This reflects the growing market value of bottled water in the UK, which has increased each consecutive year from 2014-2018.<sup>32</sup> In 2019, the UK bottled water industry was worth £3.3 billion, a 4.9% rise from the year before.<sup>33</sup> Furthermore, the UK bottled water market is forecasted to grow 3-5% a year until 2023, a figure which accounts for rising debate on plastic use.<sup>34</sup>

### 4.8 *Infrastructure and design*

Sustainable and innovative design of places and spaces is needed to overcome persistent barriers that prevent businesses and individuals from eliminating single-use plastic water bottles. Access to 'on-the-go' drinking water (e.g. refill points in train stations) is one way of enabling people to make better choices and not buy water packaged in disposable plastic bottles.

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<sup>29</sup> Department for Environment, Food & Rural Affairs. (2020) UK Statistics on Waste.

<sup>30</sup> BRITA. (2016) Survey of water bottle usage by UK Adults, with research by OnePoll. In collaboration with the Marine Conservation Society.

<sup>31</sup> EIA & Greenpeace. (2019) Checking Out on Plastics III: A survey of supermarkets' progress in reducing plastic waste (<https://www.greenpeace.org.uk/wp-content/uploads/2021/01/Checking-Out-on-Plastics-III-FINAL.pdf>).

<sup>32</sup> Zenith Global (2019). UK water drinks market (Available from [https://www.zenithglobal.com/images/Press-Release-UK\\_Water\\_Drinks-April2020.pdf](https://www.zenithglobal.com/images/Press-Release-UK_Water_Drinks-April2020.pdf))

<sup>33</sup> Available from <https://www.zenithglobal.com/news/uk-water-drinks-up-1-billion-litres-in-5-years>

<sup>34</sup> Zenith Global. (2019) UK Bottled Water Report. Online. Bath: Zenith Global Ltd. (Available from: [https://issuu.com/zenith\\_international/docs/1\\_ukbw\\_2019\\_plain\\_bw\\_report\\_w\\_samp](https://issuu.com/zenith_international/docs/1_ukbw_2019_plain_bw_report_w_samp)).

4.9 In 2018, #OneLess partnered with the Mayor of London and MIW Water Cooler experts to install the first modern network of drinking fountains across London, in 11 different London Boroughs.<sup>35</sup> Results of this project are as follows:

- Since installation we have recorded the usage of these fountains via water flow meters. Between March 2018 and February 2020, the fountains were used for 736,087 refills (500ml per refill). The majority of fountains were subsequently closed in March 2020 due to the covid-19 pandemic. We will be working with the Greater London Authority (GLA) and fountain sites to reopen all the fountains when safe to do so, with hygiene and safety guidance from the GLA.
- In 2019, research carried out by Masters Students at Imperial College London on behalf of #OneLess found 55% of fountain users surveyed at these fountain sites across London confirmed that they use fewer single-use plastic water bottles due to more fountains being available (unpublished data).<sup>36</sup>
- The positive uptake of this initial fountain network catalysed a £5 million fund by the Mayor of London and Thames Water to help deliver hundreds of further public fountains across London.

4.10 As the UK emerges from lockdown and the covid-19 pandemic, we would like to see more fountains and refills points throughout both London and the UK, increasing access to drinking water in a safe, hygienic and equitable way for all, whilst out of the home. This would reduce the reliance on purchasing water packaged in disposable plastic. Our recommendation is for more drinking water refill points in both public and private spaces (especially green and recreational spaces), and across transport systems, as well as welcome access to refilling points and tap water in shops, restaurants, visitor attractions and venues.

4.11 While the covid-19 pandemic has led to fountains and refill points being temporarily closed, when it is safe to reopen them, they should form an integral part of the UK's sustainable urban design and infrastructure.

4.12 To successfully move away from our current throwaway society, we recommend taking a 'systems change' approach, addressing the entire system of single-use plastic use in the UK.<sup>37</sup> Only this will enable us to reduce the amount of plastic litter ending up on our streets and in our rivers.

#### 4.13 *Behaviour*

Although the pilot network of drinking fountains in London has been successful and provided hundreds of thousands of refills to date, public concern remains around the hygiene and safety of tap water. These concerns are likely to be further exacerbated by the covid-19 pandemic.

4.14 In 2015, the Consumer Council for Water ran a survey on tap water usage in England (n=3,161) and found that one in five people are concerned about the cleanliness of communal drinking water taps.<sup>38</sup> In 2018, a Brita/Keep Britain Tidy survey found 61% of respondents agreed

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<sup>35</sup> <https://www.onelessbottle.org/fountainfund/>

<sup>36</sup> Nolan G., Lucas C., & Luciano Simonetti. (2019) Understanding the impact of public drinking water fountains on disposable plastic water bottle usage in London (thesis).

<sup>37</sup> <https://www.forumforthefuture.org/sustainability-and-system-change>

<sup>38</sup> Consumer Council for Water. (2016) Consumer Attitudes to Tap Water and Using Water Wisely Survey.

that they ‘worry about the cleanliness of public water taps, fountains and dispensers.’<sup>39</sup> #OneLess would strongly recommend action is taken to mitigate these concerns, including working with relevant partners to codify and implement recognised and trusted maintenance technologies and regimes, as well as educating and informing the public on the safety of tap water and refilling.

#### 4.15 Policy

A combined top-down and bottom-up approach is required to minimise plastic pollution. As well as individual behavioural change, regulation and industry interventions are needed to reduce the UK’s consumption and wasteful use of unnecessary plastic. For example, there is currently no regulation to push businesses to act on plastic bottled water reduction. So far, business action has been largely voluntary and from forward-thinking organisations.

4.16 During interviews with members of the #OneLess pioneer network,<sup>40</sup> we found that the motivation for organisations and businesses taking action to reduce single-use plastic, was driven by the need to meet sustainability and corporate social responsibility objectives and achieving health objectives.<sup>41</sup> #OneLess pioneers also referenced taking action on bottled water as an effective ‘steppingstone’ to addressing climate change and the broader ocean plastic issue.

4.17 Unfortunately, both policy and industry initiatives by Defra and WRAP’s UK Plastics Pact<sup>42</sup> have not mandated plastic bottled water as an item to be eliminated.

## 5. How can consumers be persuaded to change their behaviour to minimise pollution?

5.1 We would like to highlight that the responsibility here does not lie solely with the consumers. There are many challenges facing consumers when making decisions around single-use plastic; we want to see better policies, alternatives and education that help support behaviour change.

5.2 Single-use plastic PPE is currently necessary due to the covid-19 pandemic. However, it presents an unfortunate and additional waste challenge; with face coverings being documented as a new litter challenge throughout the UK. This requires urgent attention by government and interventions to reduce this new mismanaged and littered waste stream. Additionally, we must continue to eliminate where possible all the *unnecessary* single-use plastic we use in abundance in the UK. An easy action to reduce needless single-use plastic is to stop using plastic bottled water and switch to reusable alternatives. We have clean and safe water available via taps; people should be encouraged to refill at home, or at safe and free refill points when out and about.

5.3 We would also highlight public-facing campaigns as a behaviour change tool. In 2019, #OneLess ran a public awareness raising campaign across London to showcase the alternatives to single-use plastic water bottles that are available in London.<sup>43</sup> The campaign included outdoor advertising across London with JCDecaux, which was live in three successive waves at bus stops and

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<sup>39</sup> BRITA & Keep Britain Tidy. (2018) Water, Water, Everywhere: moving from awareness to action on single-use plastic bottles.

<sup>40</sup> Available from [www.onelessbottle.org/network](http://www.onelessbottle.org/network)

<sup>41</sup> Available from [www.onelessbottle.org/portfolio/case\\_studies/](http://www.onelessbottle.org/portfolio/case_studies/)

<sup>42</sup> Available from <https://wrap.org.uk/content/the-uk-plastics-pact>

<sup>43</sup> Available from [www.onelessbottle.org>HelloLondon](http://www.onelessbottle.org>HelloLondon).



train stations across 11 central London boroughs. Survey results revealed that Londoners who saw the advertising campaign were 30% more likely to use public drinking fountains and 34% more likely to stop using single-use plastic water bottles. Additionally, 34% of people surveyed made the connection between this issue and nature (unpublished #OneLess data, available on request).

5.4 A fit for purpose UK-wide deposit return system needs to be implemented for non-water beverages. For water, we need to drastically reduce the 7.7 billion plastic bottles used and discarded every year.<sup>44</sup>

5.5 As outlined in paragraph 4.10, access to on-the-go drinking water needs to be increased and improved across the whole of the UK. Forty-three percent of plastic bottle litter in the River Thames consists of water bottles. To tackle this major environmental issue, we need to give people easy and accessible alternatives to bottled water, e.g. reusable bottles and refilling options.

5.6 18% of Thames Water customers drink bottled water at home.<sup>45</sup> There is clearly a job to be done to understand preferences for bottled water consumption over tap water and to address this where possible.

5.7 Evidence on the safety and quality of tap water in the UK needs to be communicated widely via multiple communication channels across the UK, to reach all audiences and communities.

## **6. What is the required investment level needed to minimise storm overflows vs the scope for sustainable drainage and nature-based solutions?**

Nothing to add from ZSL here.

## **7. How effective are the planning policy and standards around sustainable drainage systems to reduce urban diffuse pollution in England?**

Nothing to add from ZSL here.

## **8. Should local authorities and highways agencies be given a duty to prevent pollution to watercourses without prior treatment?**

8.1 Emphatically, yes. A 2019 study lead by a partnership of organisations in London (GLA, ZSL, Thames21, South East Rivers Trust and The University of Middlesex) used traffic data to estimate the amount of pollution deposited on roads and predict which roads generate the most pollution. Results show that 75% of London's major roads, equating to nearly 40,000 km of road, have high potential to damage London's rivers.<sup>46</sup>

8.2 Results of a study of the Frogs Ditch (River Crane Catchment in in west London) show that road related pollution is causing levels of heavy metals and PAHs to reach environmentally damaging

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<sup>44</sup> BRITA. (2016) Survey of water bottle usage by UK Adults, with research by OnePoll. In collaboration with the Marine Conservation Society.

<sup>45</sup> Thames Water (2019) What customers want. A consolidation of our customer research and insight – version 13.

<sup>46</sup> Mayor of London, Road Runoff Water Quality Study, 2019. (Available from [https://www.london.gov.uk/sites/default/files/road\\_runoff\\_water\\_quality\\_study\\_exec\\_summary\\_dec\\_19.pdf](https://www.london.gov.uk/sites/default/files/road_runoff_water_quality_study_exec_summary_dec_19.pdf))

levels within the system and fail to fall within recommended guidelines. Concentrations of zinc and copper were found to be particularly high in both waters and sediments, especially following rainfall events with concentrations of zinc increasing from 8.9µg/l, to 38.67µg/l, dramatically exceeding the Water Framework Directive Annual Average guideline of 10.9µg/l. High concentrations of these pollutants have consistently been linked to road runoff pollution. The majority (22 of the 24 samples) of individual PAHs analysed in this study fail to remain within recommended concentration limits, above which adverse biological effects are expected to occur frequently, indicating a marked pollution problem (report in progress).

## **9. How effective is Ofwat's remit and regulation of water companies? Does it facilitate sufficient investment in improvements to water quality, including sustainable drainage systems and nature-based solutions such as constructed wetlands?**

9.1 Not in our view - there are plenty of examples in London where the sewers are discharging to rivers far too frequently and the money is not made available to deal with the deeply embedded capacity issues that are causing sewer overflows. For example, the River Brent catchment in North London is beset with badly designed and failing infrastructure issues that need a step change in investment to resolve.

9.2 Dual manholes for example, where chambers were designed to allow access to both surface and foul sewers within a common chamber but with the two systems still isolated from each other. If the seal between the separate sewers fails or are removed, foul waste can pass into the surface water systems and into rivers. The water company is aware of the issue and has conducted sub catchment surveys to find them (2014 to 2016) but investment is needed to conduct more comprehensive surveys throughout London to find and fix failing dual manholes.

9.3 Despite the multiple benefits that can be achieved by Nature Based Solutions such as wetlands (reduce flood risk, increased wildlife, improve amenity value of roads and parks, carbon capture and storage, reduced heat island effects and improved air quality) the evidence suggests that the current system of regulation disincentivises adoption of less hard engineered approaches to surface water management. We urge that OFWAT adopts an approach to regulation that obliges water companies to ringfence a proportion of their investment into Nature Based Solutions.

## **10. Is adequate investment being made in adapting water treatment systems to future climate change?**

Nothing to add from ZSL here.

## **11. How could the designation of inland bathing waters by water companies affect the costs of achieving the associated water quality standards?**

Nothing to add from ZSL here.