



An audit of the surface water outfalls, "Outfall Safari" along the River Pinn

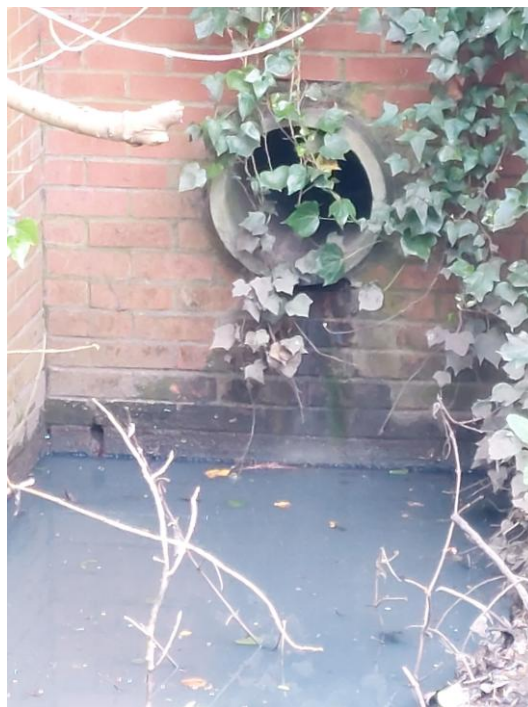
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ACKNOWLEDGEMENTS



The Outfall Safari programme in London is funded by Thames Water. The River Pinn Outfall Safari was made possible through a collaborative effort between Zoological Society of London (ZSL), Groundwork, the Environment Agency and a dedicated network of citizen scientists. We are incredibly grateful to all the volunteers who contributed their time and effort to surveying the river, providing the valuable data that underpin this report. We would also like to thank Cartographer for developing the survey recording platform that enabled volunteers to collect and submit their findings in the field.



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1. AIMS

The Outfall Safari programme in London works with local communities to survey each tributary of the Thames that flows above ground within Greater London on a four-year rotation. The Outfall Safaris form part of a wider programme of work to improve the condition of London's rivers by improving water quality and supporting the restoration of habitats and wildlife populations.

Much of outer London is served by a separate drainage system, where foul sewers carry wastewater to sewage treatment works, while surface water drains discharge to the nearest watercourse. Cross-connections between these systems can result in sewage entering the surface water network and being discharged into rivers through surface water outfalls. These can arise from misconnections, blockages, or failing or poorly designed infrastructure. Further information on water quality across London can be found [here](#). Surface water outfalls can also provide a pathway for other pollutants, including road runoff and chemicals washed into surface water drains.

Through systematic surveys of surface water outfalls, signs of pollution can be identified and assessed across a catchment. The resulting data are shared with Thames Water for follow-up assessment and potential inclusion in the Surface Water Outfall Programme (SWOP), as well as with Catchment Partnerships and Environment Agency representatives. This helps to identify and prioritise potentially polluting outfalls for further investigation and action to improve water quality across London's rivers.

The 2026 River Pinn Outfall Safari included the following watercourses:

- River Pinn

The aims of the 2026 River Pinn Outfall Safari were to:

- Record and map dry-weather conditions of outfalls within the River Pinn.
- Assess and rank the potential pollution impact of outfalls and report polluting outfalls to Thames Water for further investigation.
- Recruit and engage volunteers from communities surrounding the River Pinn, providing them with the knowledge and information needed to identify and report pollution to Thames Water and the Environment Agency on an ongoing basis.



2. METHODS

The Outfall Safari programme is designed to identify and assess potentially polluting surface water outfalls in urban river catchments. Thames Water assigns known outfalls a unique reference number and What3Words location to support the identification of individual assets. The development of long-term records associated with individual assets could, in future, enable pollution histories to be tracked over time. Trained volunteers systematically conducted bankside surveys, recording both known Thames Water outfall locations and any additional outfalls identified during the survey that were not currently recorded as known Thames Water assets. Survey data were recorded and submitted using the Cartographer survey platform. A comprehensive guide to the Outfall Safari methodology and associated resources can be accessed via ZSL's London's Rivers webpage: A guide to running an Outfall Safari ([London's Rivers | ZSL](#)).

Each outfall was assessed using a standardised survey method. Surveyors recorded the flow of discharge from the outfall, ranging from no flow to high flow. Outfalls were then scored against two indicators of potential pollution: the downstream visual impact, scored from 0 to 10 and ranging from no visible effect to an impact extending more than 30 m downstream of the outfall; and the condition of the discharge, scored from 0 to 10 and ranging from no visible or olfactory evidence of pollution to severe indicators such as gross odour, gross sewage or a very extensive pollution problem. The scores for these two indicators were combined to give each outfall an overall score between 0 and 20. Flow was recorded as part of the assessment but did not contribute to this score. Any outfall scoring 10 or above was required to be reported immediately to Thames Water for further investigation, with volunteers also encouraged to report these outfalls to the Environment Agency where possible.

Surveyors photographed each outfall as part of the assessment. Submitted surveys were subsequently reviewed and quality checked by ZSL staff through Cartographer, with photographs used alongside the recorded survey information to verify assessments and approve records.

Volunteers also recorded sections of river that could not be surveyed from the bank due to restricted access or insufficient visibility of the channel. These records were used to identify sections requiring additional survey effort, with in-channel surveys subsequently undertaken by ZSL staff where required.

3. RESULTS

A total of 23 volunteers took part in the Outfall Safari training on 12/03/2026. Surveys were conducted between 08/04/2026 and 22/06/2026. In-channel surveys were required and were completed on the 03/07/2026 and 15/07/2026.

Of the 23.5 km of un-culverted waterways identified to be surveyed, 19.2 km (81.5%) of the river was surveyed, comprising 15.8 km (67.4%) of bankside surveys and 3.3 km (14.1%) of in-channel surveys. A further 2.3 km (9.7%) was classified as inaccessible, while 2.1 km (8.8%) was not surveyed (Table 1; Figure 1). Sections classified as inaccessible could not be safely or effectively surveyed due to restricted access, private land and dense vegetation. Some sections that could not be surveyed from the bankside were subsequently assessed through in-channel surveys where suitable and safe access points were available.

Table 1, Coverage of the Pinn during the Outfall Safari surveys.

	(km)	(%)
Surveyed bankside	15.8	67.4
Surveyed in-channel	3.3	14.1
Inaccessible	2.3	9.7
Not surveyed	2.1	8.8
Total	23.5	100

Surveys identified 132 outfalls within the River Pinn (Figure 1). Although the majority showed no evidence of pollution, 17 (12.9%) surface water outfalls scored ≥ 6 (Table 2; Table 4).

Table 2, Number of outfalls and their respective scores.

Outfall Score	0	4	6	8	10
Number of outfalls	106	9	10	4	3
Percentage (%)	80.3	6.8	7.6	3.0	2.3

Three outfalls scored ≥ 10 (Figure 2), meeting the threshold for immediate reporting to Thames Water under the Outfall Safari survey protocol. Details of these high-scoring outfalls and their associated reporting reference numbers are provided below.

- Survey Number 6: Score 10, Reference number to EA N/A, Reference number to TW 1756000



- Survey Number 42: Score 10, Reference number to EA N/A, Reference number to TW 1668204
- Survey Number 60: Score 10, Reference number to EA N/A, Reference number to TW 1668219

3.1. THAMES WATER REFERENCE NUMBERS

Prior to the Outfall Safari survey season, Thames Water assigned reference numbers to 163 outfalls in the Pinn. During the surveys, volunteers or ZSL staff identified and scored 68 of these assets. Surveyors also discovered 64 outfalls that did not have an associated Thames Water reference number (Table 3; Figure 3).

Table 3, Thames Water Outfall Reference Number Information.

Total number of Thames Water outfalls assigned reference numbers	163
Outfalls present and recorded with a Thames Water reference number during the survey	68
Number of outfalls recorded with no Thames Water reference number	64
Number of outfalls with a Thames Water reference number that were found to not be present	2

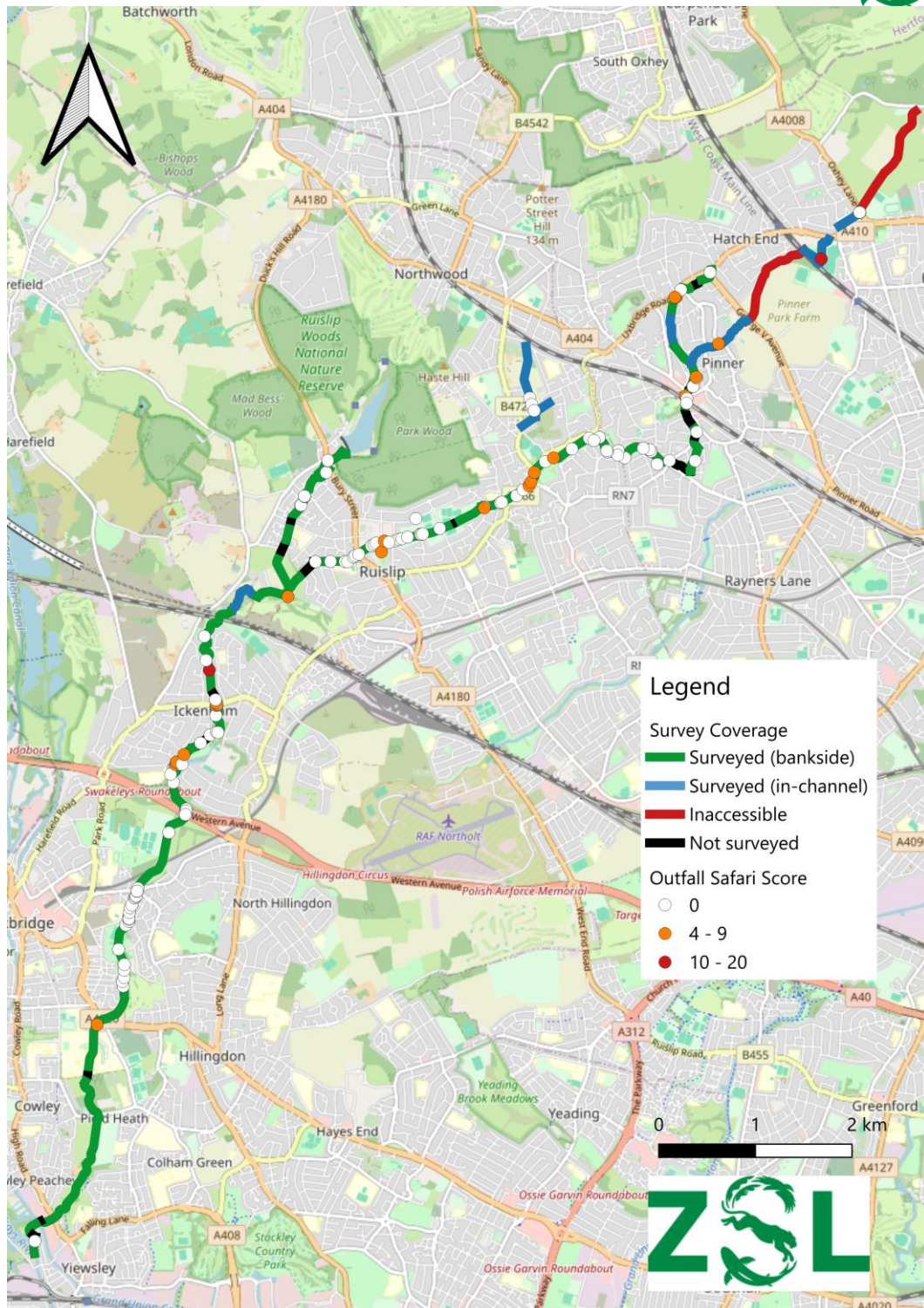


Figure 1, Surveyed sections of the River Pinn Outfall Safari area, with the locations and scores of assessed outfalls.

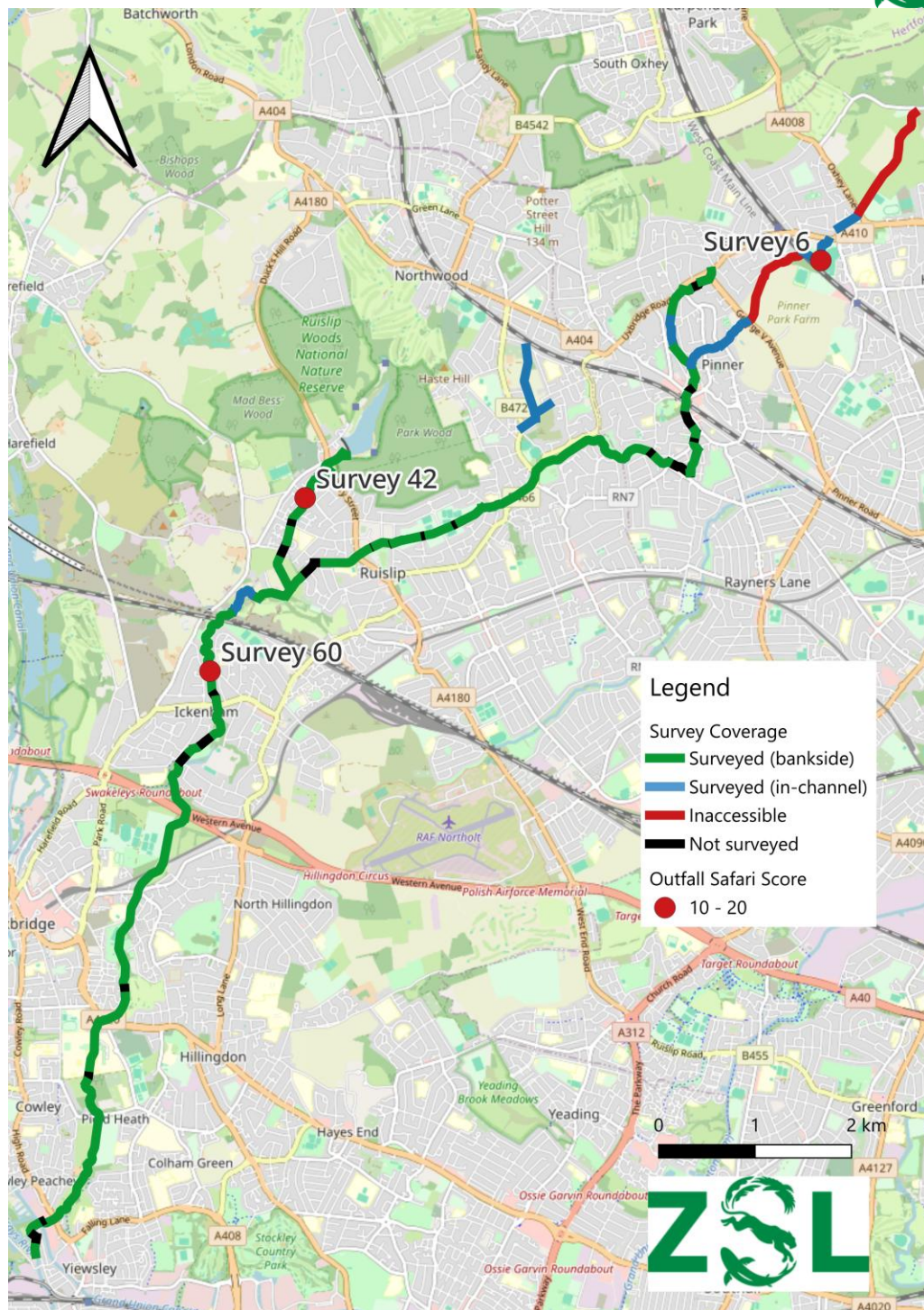


Figure 2, Locations of high-scoring outfalls (Outfall Safari Score ≥ 10) identified during the 2026 River Pinn Outfall Safari.

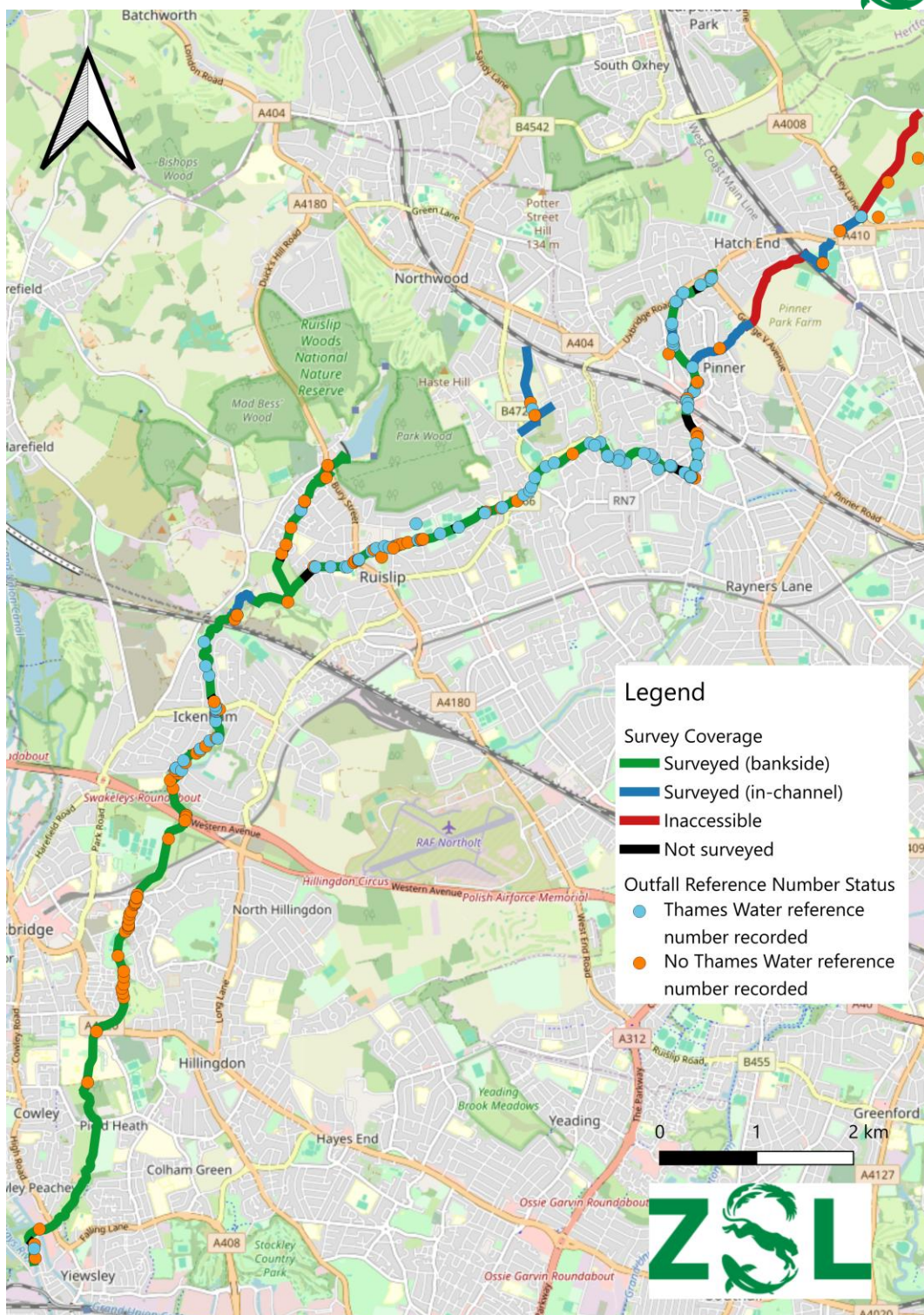


Figure 3, Locations of assessed outfalls with and without a recorded Thames Water reference number.

4. DISCUSSION

The 2026 River Pinn Outfall Safari provided an updated assessment of surface water outfalls across the River Pinn. Of the 132 outfalls assessed, 106 (80.3%) showed no visible evidence of pollution and scored 0. However, 17 outfalls (12.9%) scored ≥ 6 , including three (2.3%) that scored ≥ 10 and met the threshold for immediate reporting to Thames Water. Outfall Safari surveys provide a snapshot of conditions at the time of assessment. Some outfalls may discharge intermittently and therefore show no evidence of pollution when surveyed, while the impact of individual outfalls may vary between surveys. The results should therefore be interpreted only as a snapshot of outfalls that were polluting at the time of survey.

The survey also provided an opportunity to assess the accuracy and completeness of existing outfall location information. Of the 132 outfalls assessed, 68 were recorded with a Thames Water reference number, while 64 had no associated reference number. In addition, two locations assigned a Thames Water reference number prior to the survey were recorded as not present. These findings highlight the value of field-based surveys for verifying existing outfall records and identifying additional outfalls. Outfalls without a Thames Water reference number cannot necessarily be assumed to be Thames Water assets, and further investigation is required to establish their ownership and status. Similarly, locations recorded as not present may require further verification to determine whether existing location information needs to be updated.

Survey coverage was affected by access, safety and visibility constraints. Of the 23.5 km of watercourse identified for survey, 81.5% was successfully surveyed, comprising 67.4% surveyed from the bankside and 14.1% surveyed in-channel. A further 9.7% was classified as inaccessible and 8.8% was not surveyed. Restricted access, private land and dense vegetation prevented some sections from being safely or effectively surveyed from the bankside. In-channel surveys enabled an additional 3.3 km to be assessed where suitable and safe access points were available. Dense vegetation may also have reduced bankside visibility and made individual outfalls more difficult to identify.

There is an element of subjectivity in assigning Outfall Safari scores, particularly where outfalls are viewed from a distance or visibility is restricted, which may result in some outfalls being under- or over-scored. Photographs submitted with each assessment and subsequent quality checking by ZSL staff provided an additional level of verification. As outfalls scoring ≥ 10 are required to be reported immediately to Thames Water, clear training and guidance on applying the scoring criteria consistently are particularly important.



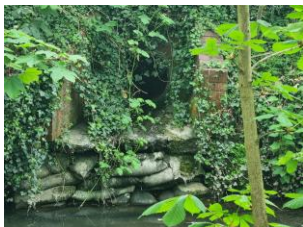
The 2026 survey was undertaken during the first year of using Cartographer as the survey recording platform, and some teething issues were encountered. In particular, pre-existing outfall locations displayed as points on the survey map could be interpreted by volunteers as indicating where an outfall was expected to be present. Some mapped locations did not correspond with an outfall observed in the field, while displaying existing locations may also have directed surveyors' attention towards mapped points and increased the risk of previously unmapped outfalls between these locations being overlooked. Future surveys should reinforce during volunteer training that the entire allocated river section should be systematically searched irrespective of the locations displayed on the map. Consideration should also be given to how pre-existing outfall locations are displayed within Cartographer to minimise potential bias while retaining useful information for surveyors.

Despite these limitations, the 2026 River Pinn Outfall Safari benefited from an engaged volunteer network, enabling a substantial proportion of the survey area to be assessed. Citizen science provides an important means of identifying potentially polluting outfalls and verifying existing outfall information across an extensive river network. Continued refinement of outfall location information, clearer guidance on the use of Cartographer, and consideration of access, vegetation and visibility when planning surveys should help improve the efficiency and completeness of future Outfall Safaris.

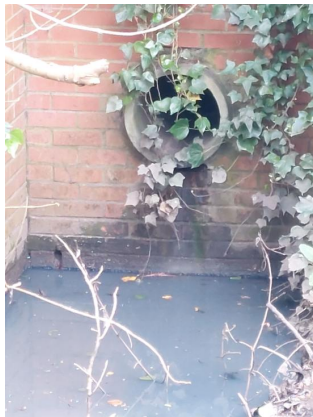
Table 4, Details and photographs of outfalls with an Outfall Safari impact score of ≥ 6 .

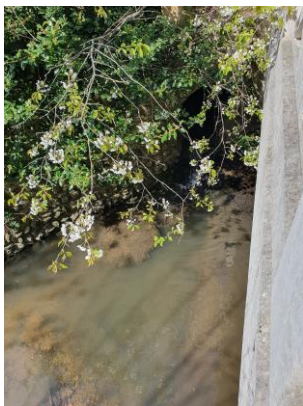
Survey Number	Location (latitude, longitude)	Bank Side	Thames Water Reference Number	Outfall Score	Image 1	Image 2	Image 3
5	51.59865, -0.37763	Right	N/A	6			
6	51.60653, -0.36229	Left	N/A	10			
26	51.55983, -0.45861	Right	N/A	6			

							
27	51.55962, -0.45872	Right	N/A	6			
28	51.55984, -0.45863	Right	PINN0152	6			

29	51.55984, -0.45861	Right	PINN0151	6			
31	51.56054, -0.45748	Right	PINN0032	6			
42	51.58448, -0.43947	Left	N/A	10			
58	51.56532, -0.45267	Right	PINN0047	8			

							
60	51.56839, -0.4537	Right	PINN0065	10			
72	51.5938, -0.38257	Right	PINN0129	6			

96	51.53546, -0.47046	Right	N/A	8			
101	51.57935, -0.42798	Right	N/A	6			
102	51.58035, -0.42755	Right	PINN0051	8			
117	51.58343, -0.41263	Right	PINN0117	8			

							
126	51.58583, -0.40566	Left	PINN0074	6			
127	51.58672, -0.40515	Right	PINN0075	6			

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Table 5, Areas identified as inaccessible and their respective start and end points.

Nearest road to inaccessible section start	Inaccessible section start (latitude, longitude)	Nearest road to inaccessible section end	Inaccessible section end (latitude, longitude)	Length (m)	Reason for inaccessibility
Old Redding	51.620253, -0.348208	Oxhey Lane	51.6110607, -0.3565191	~1210 m	Access available from Harrow Viewpoint car park, but dense vegetation prevents safe access to the channel.
Gildea Close	51.6073171, -0.3648634	George V Avenue	51.6007894, -0.3734730	~1000 m	Access restricted by the railway line, dense vegetation and private land at Pinner Park Farm.

Table 6, Areas identified for in-channel surveys, their respective start and end points and associated access points.

Nearest road to in-channel start point	In-channel start point (latitude, longitude)	Nearest road to in-channel end point	In-channel end point (latitude, longitude)	Nearest road to in-channel access point(s)	In-channel access point(s) (latitude, longitude)	Length (m)	Notes
Oxhey Lane	51.610781, -0.356602	Rowlands Avenue	51.609538, -0.359772	Oxhey Lane	51.610781, -0.356602	~270 m	Access via fence adjacent to Oxhey Lane.
Uxbridge Road	51.6084186, -0.3611177	Uxbridge Road	51.6073141, -0.3648070	Uxbridge Road	51.6080448, -0.3620680	~50 m	Access near Hatch End Swimming Pool, although dense

							vegetation may restrict access.
George V Avenue	51.600732, -0.373520	Avenue Road	51.596854, -0.381793	Moss Close Paines Lane	51.599762, -0.375756 51.598149, -0.379029	~560 m	Access next to 64 Moss Close. Access via alleyway from Paines Lane.
Waxwell Lane	51.601037, -0.384696	Waxwell Lane	51.598405, -0.384173	Waxwell Lane	51.600849, -0.384696	~310 m	Access next to 120 Waxwell Lane.
Tolcarne Drive	51.598662, -0.406530	Joel Street	51.590983, -0.406929	Linslade Close	51.592729, -0.403967	~1140 m	Access via public footpath adjacent to the river near Linslade Close and Hayden Hall Meadows.
Old Pirory	51.5751833, -0.4465293	Haul Road	51.5736787, -0.4507865	Breakspear Road South	51.574163, -0.450057	~500 m	Access via public footpath along Celandine Route; dense vegetation restricted access in places, although the river remains accessible at several points.



