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

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ACKNOWLEDGEMENTS

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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 Wandle Outfall Safari included the following watercourses:

- River Wandle
- River Graveney
- Norbury Brook

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

- Record and map dry-weather conditions of outfalls across the River Wandle and its tributaries.
- 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 Wandle, 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 10/03/2026. Surveys were conducted between 19/04/2026 and 14/06/2026. In-channel surveys were required and were completed on the 14/07/2026.

Of the 30.9 km of un-culverted waterways identified to be surveyed, 21.3 km (69%) of the river was surveyed, comprising 20.5 km (66%) of bankside surveys and 0.8 km (3%) of in-channel surveys. A further 7.7 km (25%) was classified as inaccessible, while 1.8 km (6%) was not surveyed (Table 1; Figure 1). Sections classified as inaccessible could not be safely or effectively surveyed due to factors including restricted access, dense vegetation, deep or fast-flowing water and physical modifications to the channel. Some sections were not prioritised for in-channel surveys, particularly where they were located away from properties and surrounded by fields.

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

	(km)	(%)
Surveyed bankside	20.5	66
Surveyed in-channel	0.8	3
Inaccessible	7.7	25
Not surveyed	1.8	6
Total	30.9	100

Surveys identified 105 outfalls across the River Wandle and its surveyed tributaries (Figure 1). Although the majority showed no evidence of pollution, 9 (8.6%) 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**	**12**
Number of outfalls	90	6	3	4	1	1
Percentage (%)	85.7	5.7	2.9	3.8	1.0	1.0

Two 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 45: Score 12, Reference number to EA 2496790, Reference number to TW N/A
- Survey Number 65: Score 10, Reference number to EA N/A, Reference number to TW 1674330

3.1. THAMES WATER REFERENCE NUMBERS

Prior to the Outfall Safari survey season, Thames Water assigned reference numbers to 101 outfalls in the Wandle. During the surveys, volunteers or ZSL staff identified and scored 63 of these assets. Surveyors also discovered 42 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	101
Outfalls present and recorded with a Thames Water reference number during the survey	63
Number of outfalls recorded with no Thames Water reference number	42
Number of outfalls with a Thames Water reference number that were found to not be present	10

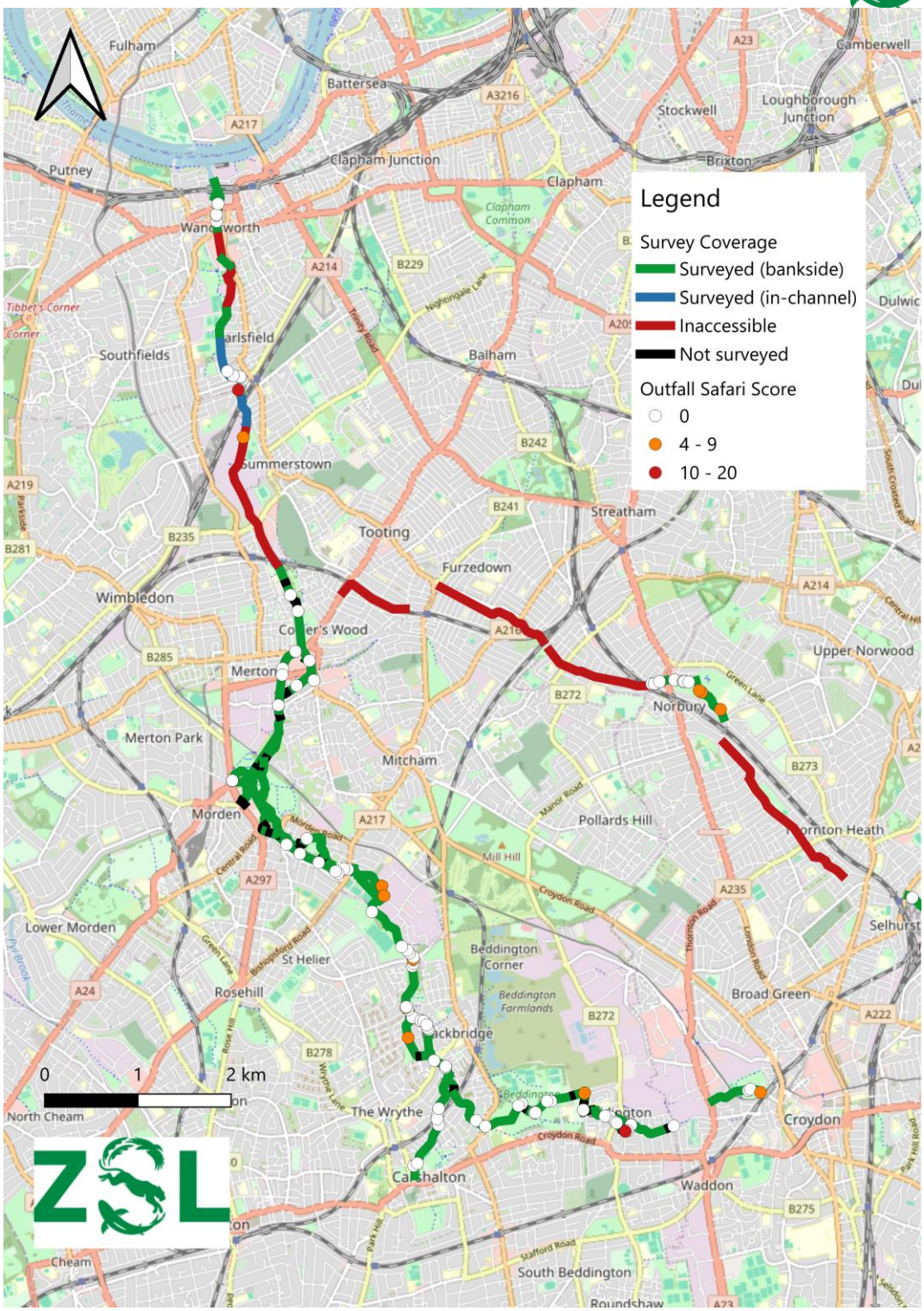

Figure 1, Surveyed sections of the River Wandle Outfall Safari area, with the locations and scores of assessed outfalls.

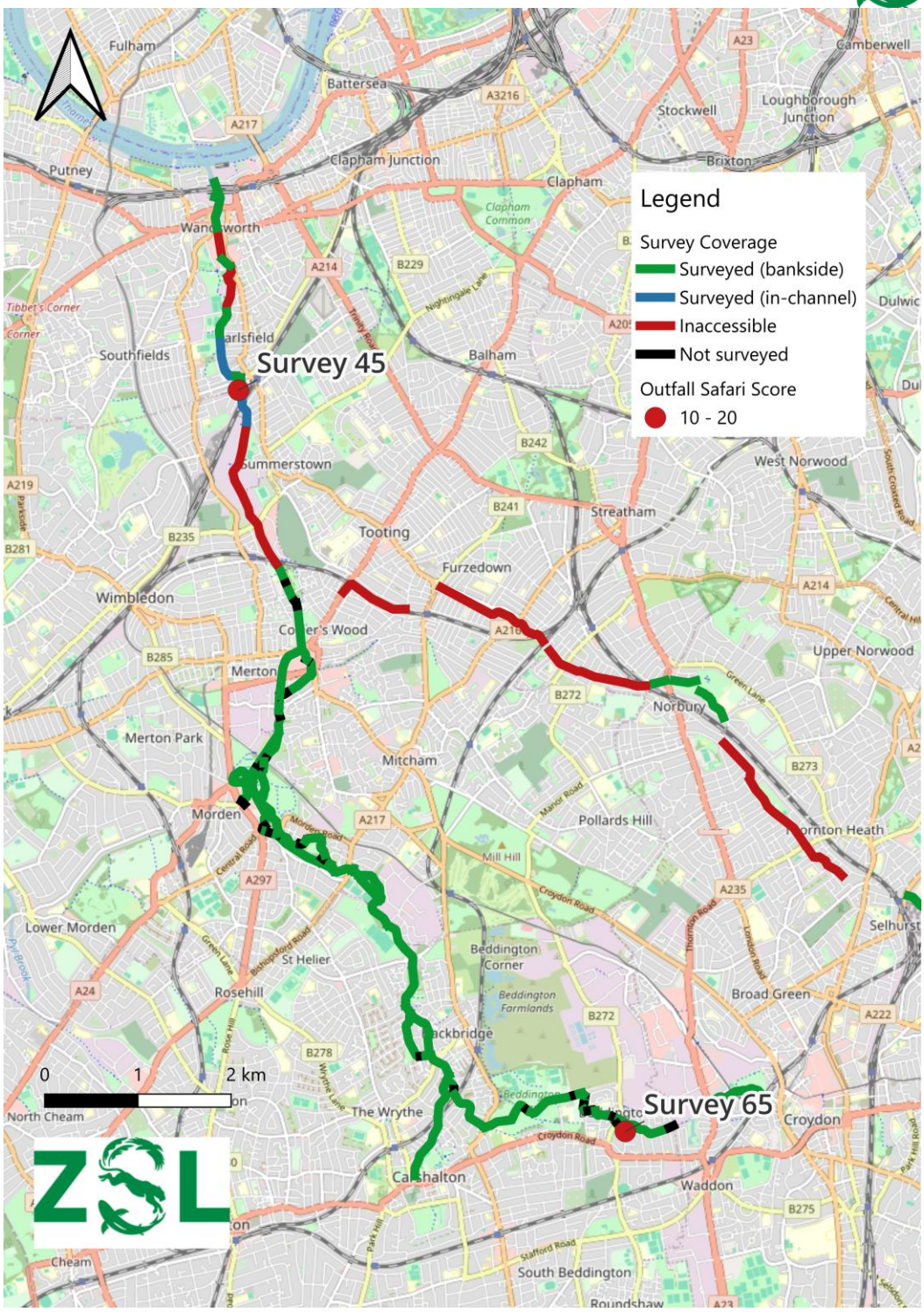

Figure 2, Locations of high-scoring outfalls (Outfall Safari Score ≥10) identified during the 2026 River Wandle Outfall Safari.

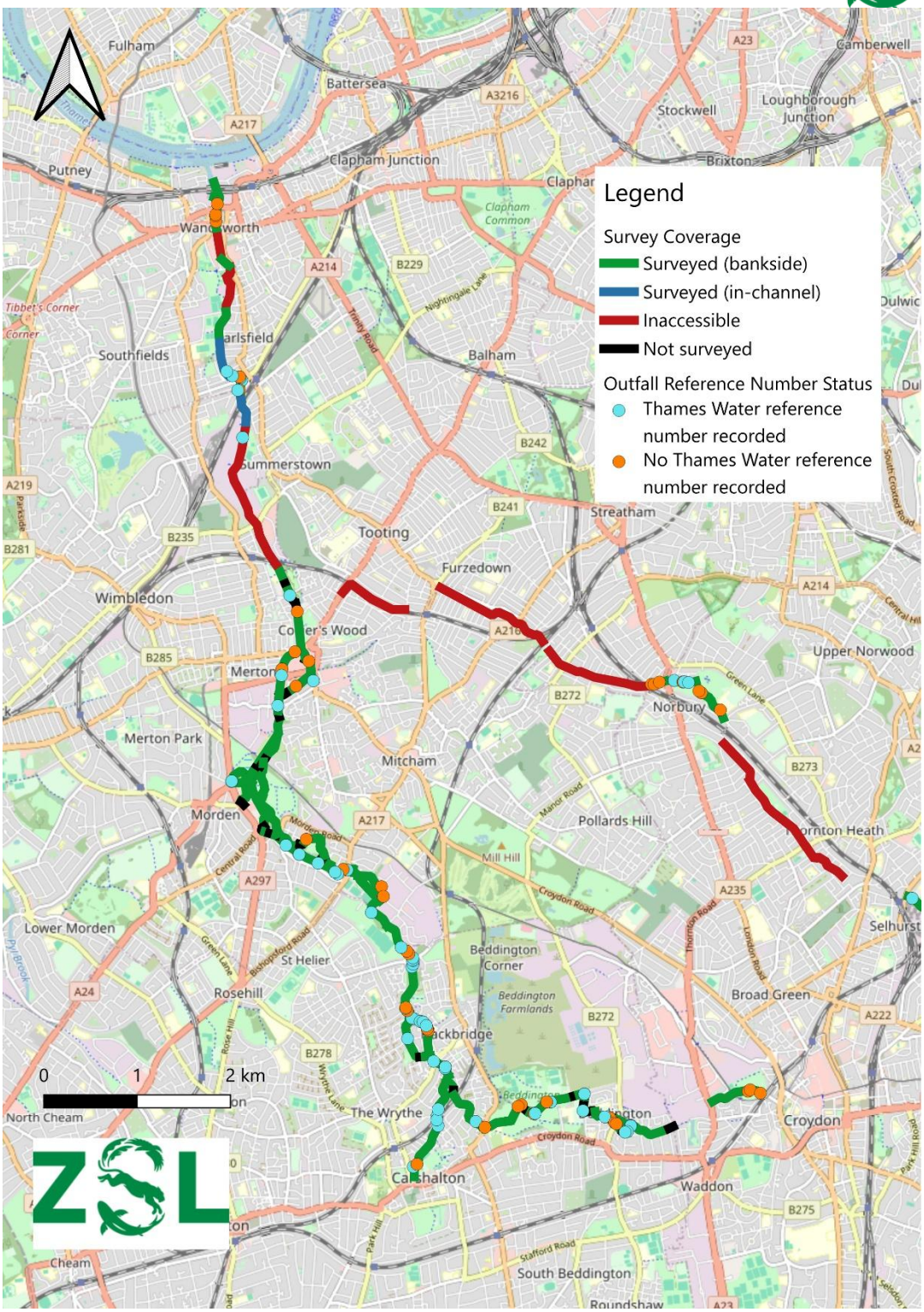

Figure 3, Locations of assessed outfalls with and without a recorded Thames Water reference number.

4. DISCUSSION

The 2026 River Wandle Outfall Safari provided an updated assessment of surface water outfalls across the River Wandle, River Graveney and Norbury Brook. Of the 105 outfalls assessed, the majority showed no visible evidence of pollution, with 90 (85.7%) scoring 0. Nine outfalls (8.6%) scored ≥6 and two (1.9%) scored ≥10. However, 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 be interpreted only as a snapshot of outfalls that are polluting at the time of the survey.

The survey also provided an opportunity to assess the accuracy and completeness of existing outfall location information. Of the 105 outfalls assessed, 63 were recorded with a Thames Water reference number, while 42 had no associated reference number. In addition, 10 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 30.9 km of un-culverted watercourse identified for survey, 69% was successfully surveyed, while 25% was classified as inaccessible and 6% was not surveyed. Restricted access, steep banks, deep or fast-flowing water and physical modifications to the channel prevented some sections from being safely surveyed (Table 5). Dense vegetation also reduced bankside visibility in some areas, making individual outfalls more difficult to identify. In-channel surveys enabled an additional 0.8 km to be assessed, although these were only possible where safe access and suitable river conditions allowed (Table 6). There is also 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 the first River Wandle Outfall Safari to use Cartographer as the survey recording platform, and some teething issues were encountered during its introduction. In particular, pre-existing outfall locations displayed as blue 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 Wandle Outfall Safari benefited from an engaged and enthusiastic volunteer network, enabling a substantial proportion of the Wandle 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. Learning from the first year of using Cartographer, together with continued refinement of outfall location information 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
25	51.39374, -0.16833	Right	N/A	6			
26	51.39279, -0.16803	Right	N/A	8			
32	51.37914, -0.16431	Left	WNDL0048	6			

							
45	51.44137, -0.19047	Left	WNDL0107	12			
54	51.3702, -0.13085	Left	WNDL0098	8			
65	51.37014, -0.1308	N/A	WNDL0017	10			

							
76	51.41234, -0.11905	Left	N/A	8			
77	51.41252, -0.11942	Right	N/A	6			
85	51.38669, -0.16357	Left	WNDL0094	8			

						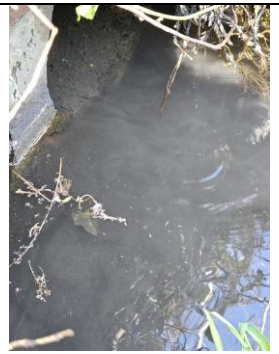	

Table 5, Areas identified as inaccessible and their respective start and end points.

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
Armoury Way	51.4587829, -0.1936498	Barley Walk	51.4582963, -0.1938570	~55 m	No bankside access or visibility due to surrounding buildings and construction.
Wandsworth High Street	51.4569300, -0.1937859	Mapleton Cresent	51.4539457, -0.1929741	~340 m	River is culverted beneath Southside Shopping Centre.
Mapleton Road	51.4531872, -0.1916921	Kimber Road	51.4488950, -0.1922833	~530 m	No bankside access or visibility due to surrounding buildings and high fencing.
Weir Road / Wandle Trail	51.4382935, -0.1892108	Garfield Road	51.4246986, -0.1846068	~1670 m	Unsafe for in-channel survey due to the presence of a weir, steep banks, fast flows and deep sections. Bankside visibility was also restricted by dense vegetation.

Robinson Road	51.4219805, -0.1742925	Longley Road	51.4203091, -0.1648999	~790 m	Unsafe for in-channel survey due to the presence of a weir and confined channel at the northern end of the section.
Seely Road	51.4224203, -0.1592420	Ellison Road	51.4131361, -0.1266348	~2450 m	Restricted access due to locked Environment Agency access points. The concrete channel, limited access and potential for rapid changes in flow also made the section unsuitable for in-channel survey.
Dunbar Avenue	51.407440, -0.115582	Treetops Court	51.3947336, -0.0973852	~1890 m	Restricted access due to locked Environment Agency access points. The concrete channel, limited access and potential for rapid changes in flow also made the section unsuitable for in-channel survey.

Table 6, Areas identified for in-channel surveys and associated access points.

Nearest road to river entry point	River entry point (latitude, longitude)	Nearest road to river exit point	River exit point (latitude, longitude)	Length (m)	Notes
Lydden Road	51.4468082, -0.1934004	Weir Road / Wandle Trail	51.4382935, -0.1891989	~1100 m	Safe entry point adjacent to flats near Lydden Road. Safe exit point onto the Wandle Trail, with low banks providing suitable access.