Introduction

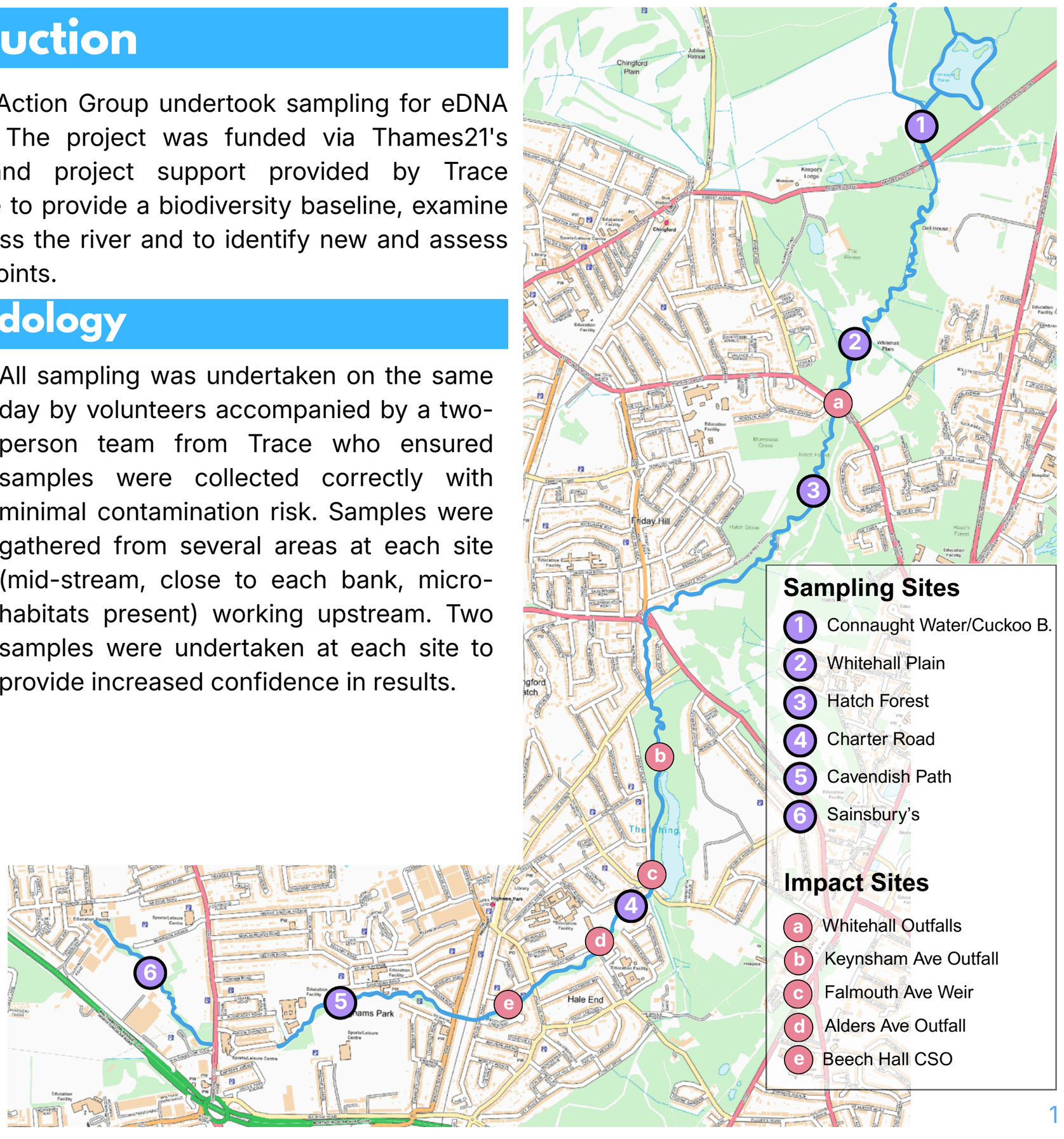
In March 2026, volunteers from the Ching Action Group undertook sampling for eDNA analysis from six points along the river. The project was funded via Thames21's EMPOWER rivers grant and analysis and project support provided by Trace Biomonitoring. The aims of the project were to provide a biodiversity baseline, examine whether species assemblages differed across the river and to identify new and assess the impact of known barriers and pollution points.

Methodology

Sites were selected to provide a representative sample of the different habitat types across the river and coverage of the three "Restoration Reaches" identified in the Ching Action Plan (2024.) The location of key structures, modifications and outfalls which may impact water and habitat quality was also factored in. As far as possible, sampling points were positioned approximately 1km apart to increase the likelihood of independent results.

It was decided to undertake sampling in early spring as in previous years the river has suffered from very low flow at Whitehall Plain and dried up completely around Connaught Water during late spring/summer.

All sampling was undertaken on the same day by volunteers accompanied by a two-person team from Trace who ensured samples were collected correctly with minimal contamination risk. Samples were gathered from several areas at each site (mid-stream, close to each bank, micro-habitats present) working upstream. Two samples were undertaken at each site to provide increased confidence in results.

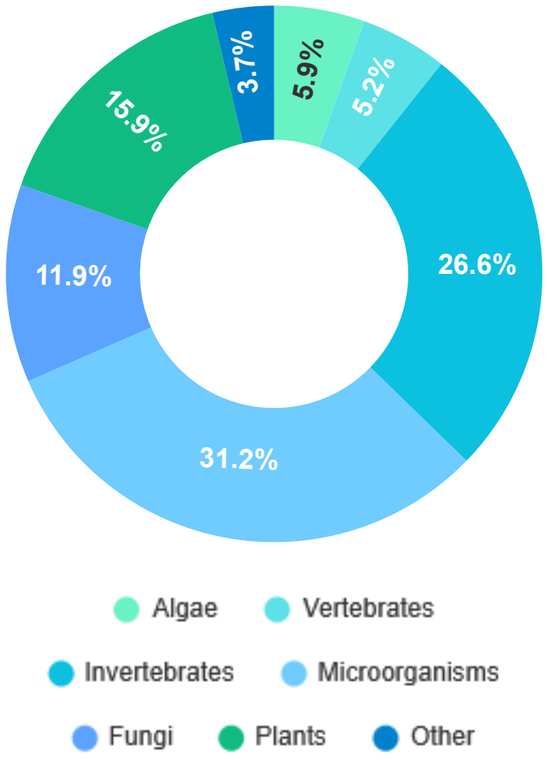


Results

The full eDNA results can be viewed here:
https://trace-biomonitoring.shinyapps.io/edna_cag-001/

Summary

In total 1885 unique taxa were detected with microorganisms and invertebrates the most numerous and Whitehall Plain and Cavendish Path having the most detections.



The results broadly line up with expectations and existing water quality data with pollution-sensitive taxa more common in the upper reaches, a more diverse array of fish species present below Falmouth Avenue weir and indicators of sewage pollution more frequent in the lower, more urban stretches.

Notes on Interpretation

The results for each site indicate the species present both at and upstream of the sampling sites (e.g. Site 1 includes species present in Connaught Water; despite being below Falmouth Avenue Weir, Site 4 detections are indicative of species above and below the weir.)

All detection received a score showing how many DNA reads matched that organism. This functions as a confidence score (see below). Lower confidence results should thus be treated with caution.

Low Confidence	Medium	High Confidence
>30 reads	30 - 200 reads	200+ reads

Additionally, as eDNA counts are not directly equivalent to abundance, subsequent analysis is focused more on presence/absence and broad patterns than numbers.

Notable Detections

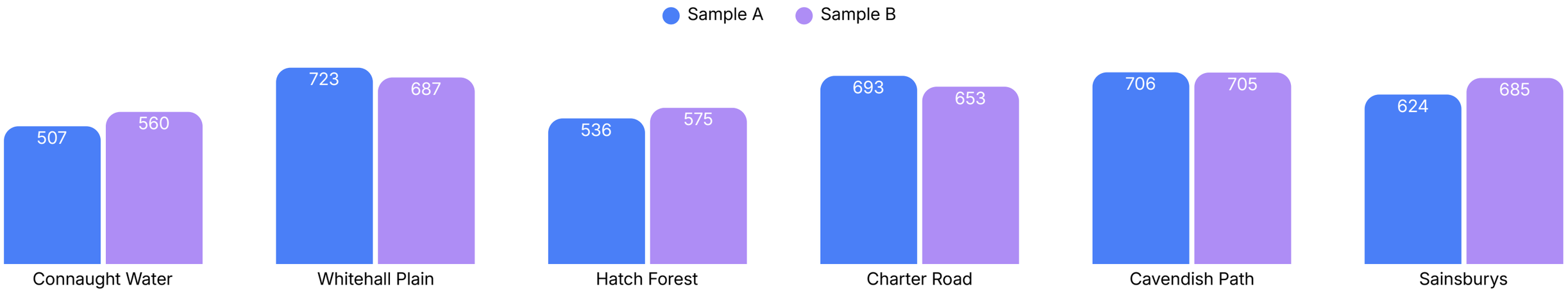
The surveys identified:

12 fish species across the river including the endangered European eel

4 amphibian species - the common frog, toad and smooth and palmate newts

Several important indicator species for freshwater habitats including **stoneflies** and *Lophopus cystallinus* - a bryozoan "crystal moss animal"

Peach Blossom Jellyfish (*Craspedacusta sowerbii*) an illusive, freshwater jellyfish originally from China



Fish Data

12 freshwater fish were identified to species level across the river – including two distinct stone loach lineages. Atlantic cod, and several other family/genus level groups such as tuna, were also detected, likely stemming from pollution/contamination – these are discussed further on page 6.
The distribution patterns follow broad habitat gradients and highlight the impact of barriers to movement across the river:

Upper Ching: **Site 1** (Connaught Water/Cuckoo Brook) is dominated by still-water species like pike, carp, rudd and bream and interestingly, has 0 stickleback detections. **Site 2** (Whitehall Plain) retains some of these still water species, but stickleback appear. These peak at **Site 3** (Hatch Forest) while many of the still water species decline sharply or disappear entirely. European eel is also detected but at a very low level. Due to the nature of the sampling, it is impossible to know which detections reflect species in the Ching itself and which are stem from Connaught Water, however it is likely some smaller species enter the river from the lake during periods of high flow.

Transition Zone: The fish assemblage changes at **Site 4** (Charter Road) which is directly below the Falmouth Avenue weir. Stone loach and chub appear, detections of perch and tench increase. Despite this, the site has the fewest overall species detected (six) – notably lower that Sites 5 and 6. The weir and the associated concreted sections likely contribute to this.

Lower Ching: **Site 5** (Cavendish Path) and **Site 6** (Sainsburys) are surprisingly fish-rich, despite the declining water quality and increasing urbanisation. European eels are detected in high numbers; stone loach, stickleback, perch, roach and chub are abundant and several species which are scarce/absent between Sites 3 and 4 re-emerge/increase. The appearance of eel in particular suggests the lower reaches maintain adequate oxygen levels and refuge habitats for fish and connectivity with the Lea is maintained.

When reviewed as a whole, the fish data suggests the Falmouth Avenue weir may be acting as a major barrier to fish movement across the river. Eels are fairly abundant below and potentially present in very small numbers at Hatch Forest, indicating greatly reduced colonisation and stone loach – which are not strong barrier crossers are not present at all. Fish in the upper reaches may persist in isolated populations or enter via Connaught Water. Concreted sections, including the sluice connecting Connaught Water to the river and around Whitehall outfalls, combined with low-flow during the summer likely further fragments habitats in the Upper Ching.

There are also some notable absences – species like bullhead, dace and minnow are present elsewhere in the Lea catchment and are often found in small streams like the Ching. There are multiple potential explanations for these absences ranging from difficulty accessing the Ching from the Lea to seasonal fluctuations.



We also detected salmonid DNA from Site 3 downwards, but only to family level. This means we cannot determine whether this stems from potential pollution or populations of species like brown trout.

Invertebrate Patterns

Several important indicator species/species groups were detected across the river. These can be used to identify changes in habitat type and water quality and assess their impact on ecological health.

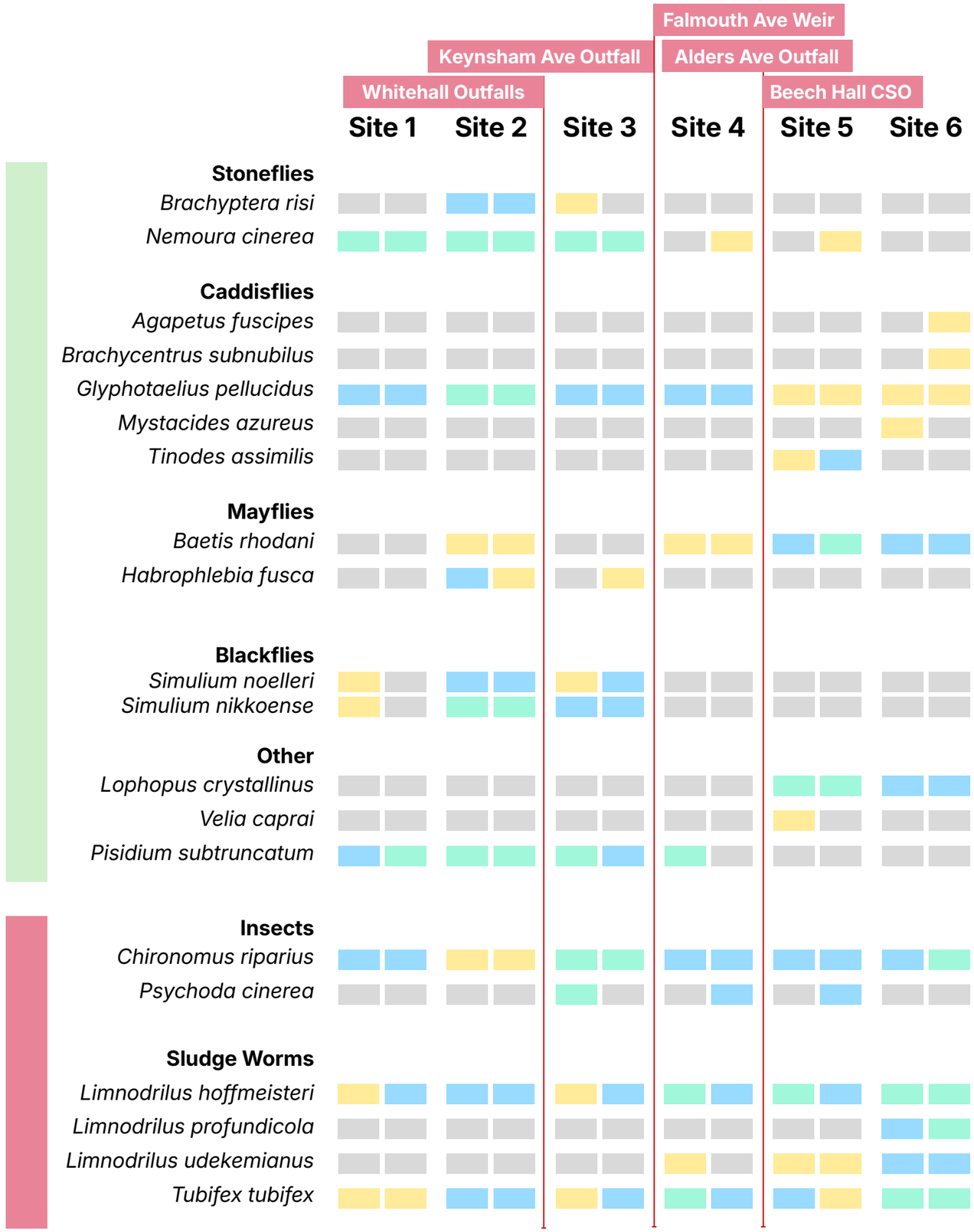
Upper Ching: **Sites 1 & 2** support high numbers of species associated with well-oxygenated, flowing water habitats with low organic pollution including stoneflies, blackflies, mayflies, caddisflies and pea mussels (*Pisidium subtruncatum*.) **Site 1** (Connaught Water) has fewer stoneflies, mayflies and lower levels of blackflies and as with the fish patterns, the broader dataset includes more standing water-associated invertebrates. **Site 2** (Whitehall Plain) appears to be the "best" stream habitat in terms of invertebrates.

Transition Zone 1: Species patterns begin to change at **Site 3** (Hatch Forest) with an uptick in species associated with organic pollution like *Chrionomus riparius* and *Psychoda cinerea* which is particularly associated with biofilms in drains. As the site is below the Whitehall Road Outfalls, this was expected. Many positive indicator species are still present though in lower numbers with the exception of *Nemoura cinerea*.

Transition Zone 2: There is a more marked shift at **Site 4** (Charter Road) with blackflies disappearing, declines in stoneflies and pea mussels and an increase in sludge worms. However, caddisfly and mayfly species remain present, with some increasing downstream showing water quality has not collapsed completely. This could suggest the change in habitat above and below the weir also plays a role in changing communities.

Lower Ching: Downstream of Charter Road, stoneflies, blackflies and pea mussels effectively disappear and sludge worm numbers increase. *Baetis rhodani* detections also increase and several caddisfly species appear at **Site 6** (Sainsburys) though in very low numbers, indicating that though organic enrichment increases, the river can still support relatively sensitive aquatic species. Additionally, several interesting species appear at **Site 5** (Cavendish Path) including water crickets (*Velia caprai*) and crystal moss animals (*Lophopus crystallinus*) both of which are associated with slower-flowing, vegetation rich water.

So, while there is a downstream loss of sensitive species which mirrors increased pollution and urban influence, habitat change seems equally impactful with clear zones appearing: the lake-influenced headwater (Site 1), flowing stream habitat (Site 2 – 3) and the slower flowing, increasingly enriched urban waterbody from Site 4 onwards.



Pollution Indicators

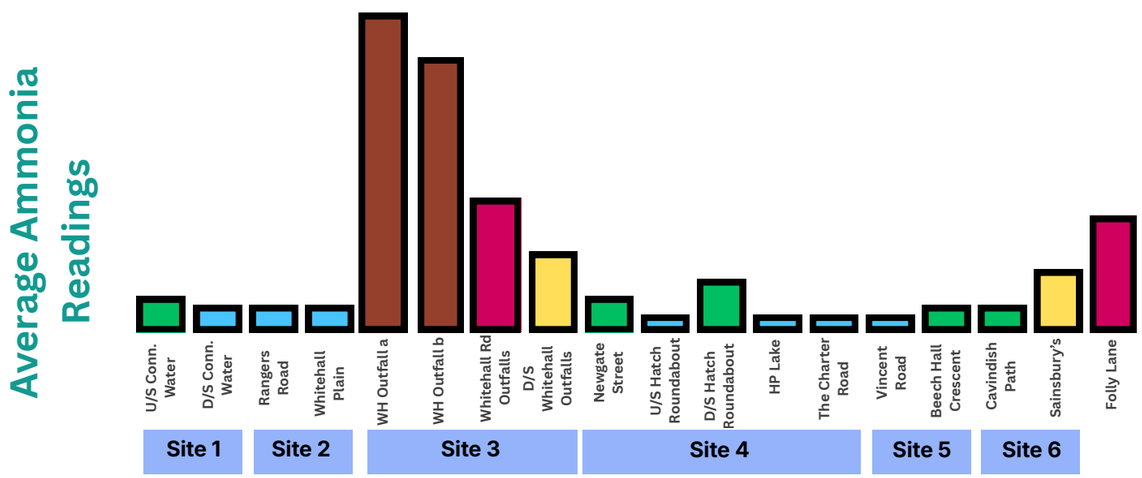


While cattle are present itermitently at Site 2 and around Site 1, they were not on site during sampling or the weeks proceeding sampling and detections increased markedly at Site 3, peaking at Site 5.

The bacteria datasets and presence of several "out of place" species (i.e. those that are extremely unlikely to be present in the local area) provide clearer evidence of pollution and urban contamination across the river. Importantly, these indicate several inputs rather than a single, severe pollution source:

- **Upper Ching:** As expected, bacteria associated with wastewater, sewage-contamination, faecal material and vertebrate guts increase from **Site 3** (Hatch Forest) with marked increases in several dietary-associated groups.
- **Lower Ching:** Several notable bacteria groups peak at **Site 4** (Charter Road) and **Site 5** (Cavendish Path) – Cavendish Path is below the Beech Hall CSO while Charter Road may be impacted by the Keynsham Avenue outfall, or the weir may compound issues through increase sediment accumulation. There is also an increase in "out of place" species detections, with most peaking at Cavendish Path. These could have several sources but when paired with the bacteria data, wastewater contamination stemming from human sewage, food waste, misconnections etc. is plausible.

These patterns broadly follow water quality data gathered by the Ching Action Group, with water quality being generally good across Sites 1 and 2 and degrading further down the river (see below). Ammonia - associated with sewage contamination - spikes at the Whitehall Road Outfalls where there are confirmed misconnections and this lines up with the spikes in several bacterial indicators at Site 3. Similarly, there is a confirmed CSO at Beech Hall upstream of Site 5 which could explain detections of 'out of place' species. The uptick at Charter Road could be due to a number of factors including outfalls upstream or inputs from dogs and water fowl.



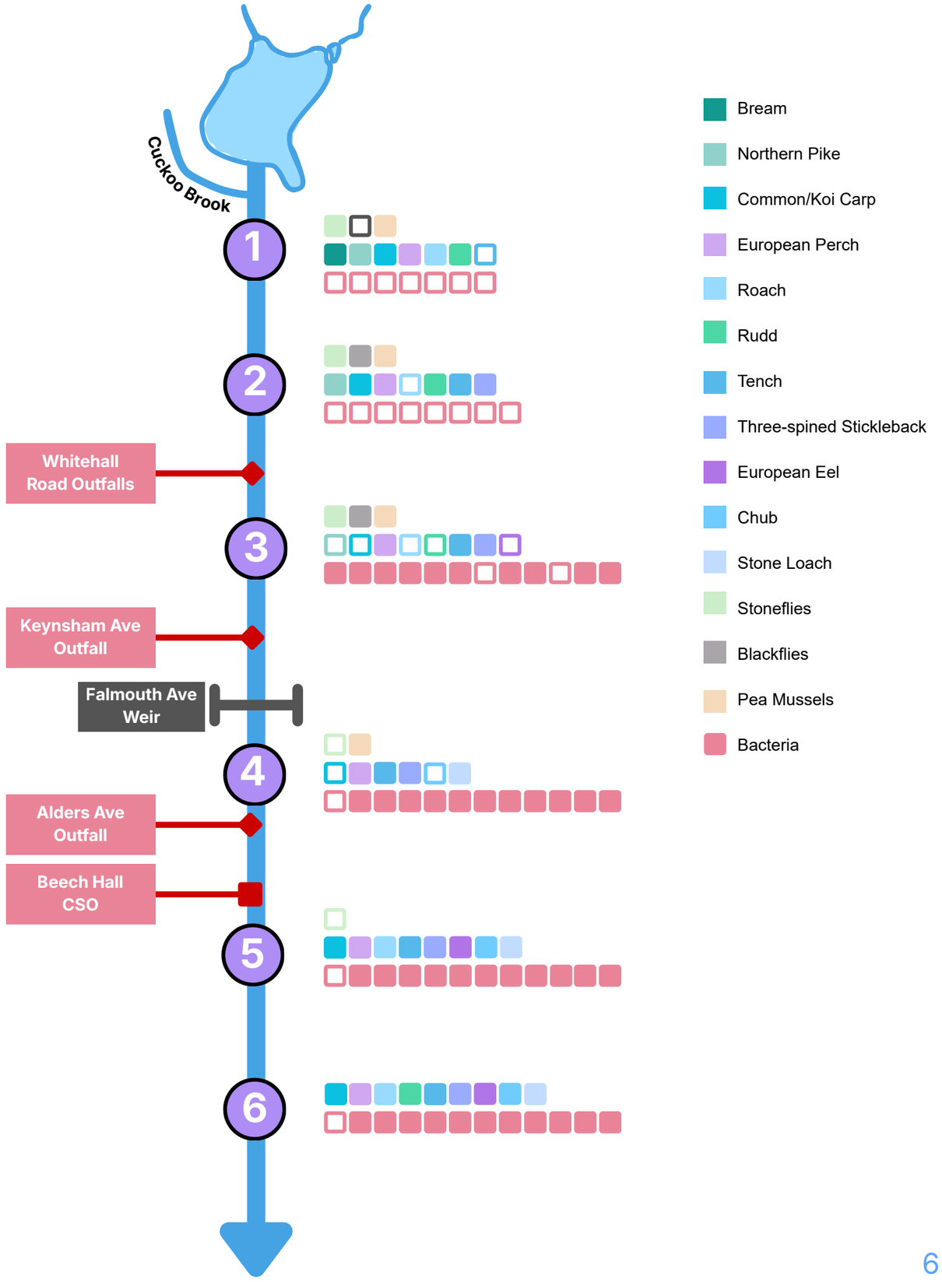
Discussion

The eDNA results show the river supports a surprisingly diverse ecological community despite being subject to multiple pressures including pollution from confirmed misconnections, the Falmouth Avenue weir and concrete modifications which impact habitat connectivity, structure and flow.

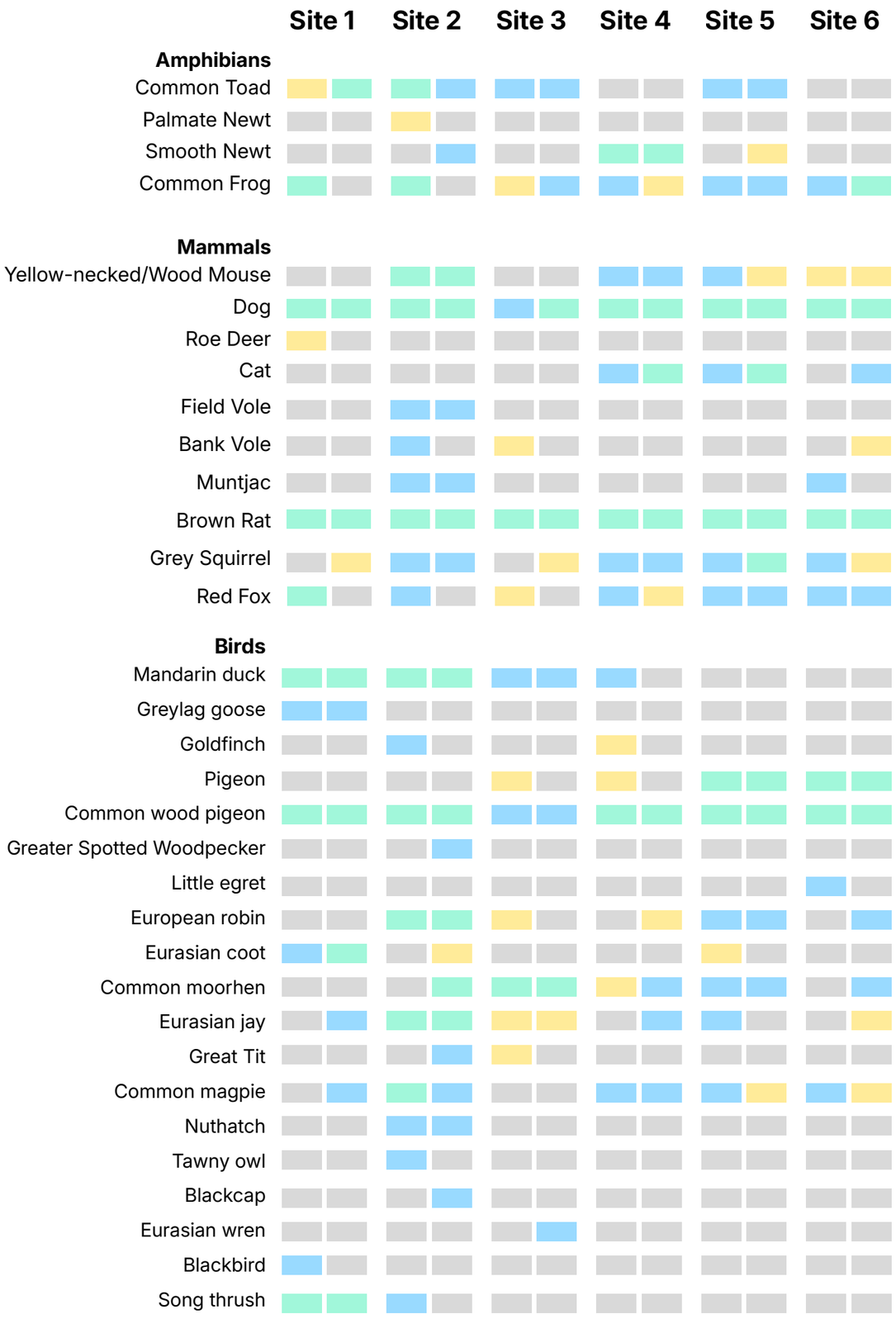
There is a clear progression from upstream to downstream:

- **Site 1** is characteristic of a lake-dominated head water, with high levels of still-water fish species, no sticklebacks and low detections of flow-loving blackflies. It supports pollution-sensitive stoneflies and pea mussels but is likely negatively impacted by the concrete sluice connecting Connaught Water to the river and seasonal low flow rates / drying.
- **Site 2** is perhaps the most healthy flowing stream habitat, supporting high levels of pollution sensitive invertebrates and low pollution indicators. While the fish data features many of the still-water loving species from Site 1, stickleback appear suggesting some fish species are present in the river rather than they simply being downstream detections from Site 1.
- At **Site 3**, many of the pollution sensitive invertebrates are still present, stickleback detections peak and we see an uptick in pollution tolerant species and associated bacteria. Of course, we cannot definitively determine which sensitive invertebrates are present below the Whitehall Outfalls as some detections may stem from upstream.
- From **Site 4** downwards, the most pollution sensitive species and blackflies are effectively lost and pollution signals increase. Despite this, fish diversity increases and diverse aquatic invertebrate communities are supported across all sites.

These patterns suggest that while water quality is impacting the rivers ability to support certain species groups, it is not so deteriorated that any sampling sites could be considered ecologically collapsed. Instead, habitat fragmentation and man-made features impacting flow and habitat structure - in particular the Falmouth Avenue Weir - seem to have a greater influence over species communities across the river.



Additional Detections



Amphibians

We detected 4 out of the 7 native amphibian species with the common frog being the most widespread and palmate newt the lowest confidence. The distribution pattern is in line with expectations, following the habitat preferences of each species.

Mammals

16 species of mammal were detected to species level. Of these, 4 were domestic (cattle, dog, cat and sheep) and 4 stem from suspected contamination (Red deer, Chinese water deer, sheep and cattle below Hatch Forest.) These have not been included in the diagram to the left. Brown rats and dogs were the most frequently detected across the river with dog detections highest at Connaught Water and Charter Road and rat detections highest at Whitehall Plain.

No particularly notable mammal species were detected though the decision to sample in March reduced the probability of species like bats and hedgehogs being identified as it was too early for peak activity. Other mammals - like badgers - would also have lower contact with water during these months. If we had sampled in summer, it is possible a wider variety of mammal species would have been identified.

Birds

22 birds were detected to species level across the river, with 3 which likely stem from contamination (Red-legged partridge, Turkey and Pheasant.) It should be noted that this is not a representative sample as it can be difficult to differentiate closely related species e.g. dabbling ducks, corvids, geese.

Again the species detected are in line with expectations and data collected from spring/summer bird song surveys in 2025 and 2026. Wood pigeons were the most commonly detected species and Whitehall Plain had the most overall species detections.