UNIVERSITY OF BIRMINGHAM

Birmingham Institute for Sustainability and Climate Action

Restoring the Cole for people and nature

Incorporating community knowledge and values within urban river restoration visions

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July 2025

Executive summary

River restoration practices are being widely applied globally, typically with the overarching aim of enhancing channel physical habitat complexity to provide environmental benefits such as biodiversity improvements. However, these interventions often **overlook community knowledge**, **values** and **visions**, which can lead to the public not benefiting from environmental improvements in their local green or blue spaces. In this project, we aimed to pilot different public engagement techniques to ascertain the plural forms of knowledge and values held by local volunteer groups towards a 5km stretch of the **River Cole** – an iconic watercourse in the highly urbanised context of southern Birmingham. Volunteers within the project proactively participate in conservation actions along the Cole, many of which engaging with the 'Birmingham River Champions' citizen science initiative. In this project, 12 volunteers participated in **walking interviews** to offer place-based insights on how and where they engage with the Cole. Additionally, various river **environmental surveys** were undertaken *via* Birmingham River Champions data and physical habitat observations. Details from walking interviews and environmental surveys were then presented to volunteers at a **community workshop** attended by 21 participants, which were discussed openly before partaking in activities on potential changes from hypothetical restoration options. Our results indicated that communities interact with the Cole in various ways, including walking, foraging and nature engagement. A recurring theme was how the watercourse is a vital green / blue space where individuals feel like they are **away from the city,** and provide various sensory benefits such as flowing water soundscapes and nature aesthetics. However, concerns were raised on **litter** and **antisocial behaviour**, particularly in more deprived areas in the northern parts of the study area further downstream. Environmental surveys indicated broad **declines** in **ecosystem health** moving downstream that were likely linked to increased pollution pressures. The community workshop highlighted that participants were typically **in favour** of prospective restoration actions **promoting natural** functions and features, with two notable exceptions. First, participants valued two sets of **stepping stone** crossings and emphasised their wishes for these to be retained should the associated weirs be removed – but otherwise volunteers were broadly in favour of this. Second, the **last working ford** along the Cole (Green Road) held strong and varying views, and changes to this may thus require thorough public consultation. This document indicates key considerations that future restoration initiatives along the Cole could consider to meet the needs of both **people** and **nature**. The walking interviews and community workshop were **positively received** by volunteers, who enjoyed the opportunity to share and discuss their views and interact with academics, environmental managers and fellow volunteers. The public engagement methods trialled here could thus be more widely applied to facilitate the **co-creation** of river restoration solutions.

Introduction

Various human activities have transformed river environments beyond recognition worldwide. This includes releasing pollution 'cocktails' into watercourses, including untreated sewage, and creating unnaturally straight channels lacking in habitat diversity that are disconnected from their floodplains. Many of these modifications have been deemed necessary for human development, enabling land cultivation, flood alleviation and erosion protection. Additionally, some unnatural river features like iconic infrastructure (e.g., weirs, bridges) can be valued by communities. However, river degradation has led to biodiversity losses, reduced natural beauty and pollution health risks, which has contributed to communities becoming increasingly disengaged with their local watercourses. As such, holistic river management interventions are required that simultaneously benefit people and nature, and hence balance a need to reinstate natural ecosystem elements whilst also considering features and qualities valued by local communities.

River 'restoration' entails modifying the physical outline of channels. This includes 'rewiggling' channels by introducing meanders or inputting tree ('woody') material to increase habitat diversity. Given that human changes to rivers have often occurred over many centuries, river restoration is rarely a 'reset' to natural conditions, but a chance to reinstate some natural, or at least improved, habitat features. Restoration objectives are often focussed on environmental outcomes, but how local communities interact with and value their local watercourses are rarely considered. This can result in communities not benefiting from or being dissatisfied with environmental improvements in their local green or blue spaces.

In this project, a team of water and social science experts at the University of Birmingham piloted different community engagement techniques to understand how local communities value and engage with an urban watercourse. We aimed to use this knowledge alongside evidence of river ecosystem health (much of which community-generated) to co-produce insights informing holistic restoration visions. The mid-reaches of the River Cole in southeast Birmingham (Figure 1) were targeted given the ongoing engagement already held with local volunteers (see below), as well as evident changes in river health and community demographics along the course. Moreover, the Cole is an iconic watercourse, supplying water-driven mills dating as far back as the 10th century[1] and inspiring J.R.R Tolkien when creating the 'Lord of the Rings' universe[2].

We leveraged connections that the project team had already established with volunteers within the Birmingham River Champions[3] citizen science initiative. From this, the 'Friends of Trittiford Park and Pool' (FTPP) and 'Hall Green Keepin' It Clean' (HGKIC) were first invited to participate. FTPP monitor upstream of other volunteer groups at Trittiford Park, while HGKIC have sampled in the Springfield area along Blackberry Way further north towards the city; the latter of which faces higher levels of socio-economic deprivation[4]. We were unable to attract as many HGKIC participants compared to FTPP, so we also reached out to Sarehole Environmental Action Team (SEAT) volunteers to engage with similar numbers of participants across the two areas. SEAT undertake conservation activities along the Cole at Sarehole Mill Recreation Ground and Greet Mill Meadows, which is immediately upstream of where HGKIC monitor. Although not officially registered with Birmingham River Champions, SEAT have engaged with the project on training days, and have also co-organised joint events (e.g., litter picking) alongside HGKIC.

All last accessed 06/06/25: [1]https://aghs.jimdofree.com/watermills-of-the-cole-valley;
[2]https://www.birmingham.gov.uk/directory_record/9168/shire_country_park;
[3]https://birminghamriverchampions.shinyapps.io/BirminghamRiverChampions/;
[4]https://www.nomisweb.co.uk/sources/census_2021

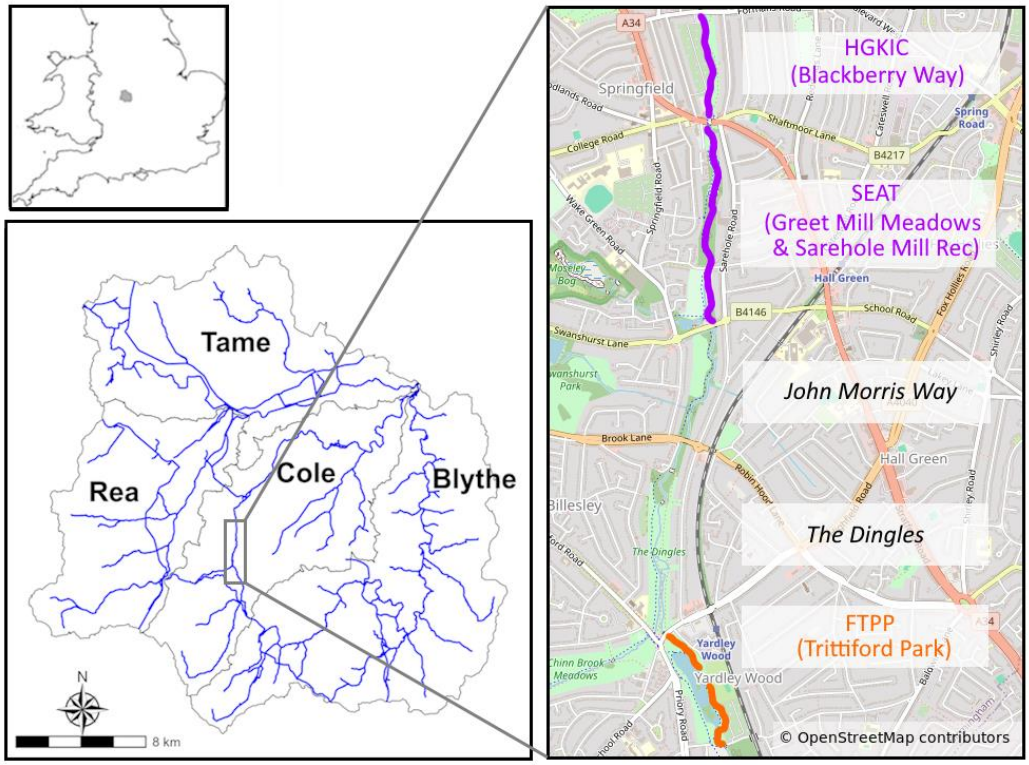

Figure 1 – A study map showing stretches of the River Cole examined in this project and the corresponding volunteer groups: HGKIC = Hall Green's Keepin' It Clean; SEAT = Sarehole Environmental Action Team; FTPP = Friends of Trittiford Park and Pool.

We adopted three primary methods within this project: (i) walking interviews, where individual participants could offer place-based insights into how they value and engage with different parts of the Cole; (ii) various river environmental surveys indicating pollution pressures, ecological health and physical habitat diversity; and (iii) a community workshop, where findings from (i) and (ii) were presented and discussed collectively by participants alongside additional activities on hypothetical restoration options and changes to river attributes.

Walking interviews

Rationale and methodology

Walking interviews were conducted due to their ability to capture rich, contextualised knowledge that emerges through movement, sensory engagement, and memory recall. This approach allowed participants to guide researchers through spaces of personal importance, fostering conversations shaped by sights, sounds, and lived experiences.

Participants were initially recruited through direct email invitations. Walking interviews were conducted with 12 environmental volunteers between August and October 2024. Six of these were undertaken with FTPP volunteers, while the remainder were evenly divided between HGKIC and SEAT volunteers. Participants spanned a range of ages (from early 30s to 70s) and genders. All interviewees were active in regular conservation work, including litter picking and invasive species control, and most were involved with Birmingham River Champions monitoring, but to

varying degrees (FTPP participants sampled most frequently, HGKIC have undertaken some monitoring and training, while SEAT are not directly involved, see above).

Interviews with FTPP were predominantly conducted along Trittiford Park and The Dingles, while those with HGKIC and SEAT were typically undertaken across Blackberry Way and Greet Mill Meadows, with one walk covering John Morris Way. While the interviewer suggested routes corresponding with primary volunteering locations, this was adaptable in case participants had preferred areas to visit and discuss. Each interview lasted 60-90 minutes. Researchers identified two or three key locations to prompt discussion, but the format remained flexible to encourage spontaneous reflection. Topics included sensory engagement with the Cole, emotions in the river environment, observed environmental changes, personal histories with the watercourse, activities (both conservation and otherwise), and visions for the future of the Cole. All interviews were audio-recorded with informed consent and transcribed in full.

Interview data was analysed following standard techniques for thematic analysis of qualitative data, to capture relevant themes across participants' knowledge and experiences around the River Cole environment, as well as their emotions, preferences and values. NVivo software was used to manage, organise, and systematically analyse the data. Analysis considered common themes, diversity of views, group-specific insights, and locational specificities.

Results and insights

The walking interviews illuminated the River Cole as a layered and lived environment. The watercourse is a source of memory, wellbeing, and community belonging. Through volunteering, participants not only monitor and maintain the river's environmental characteristics but also actively shape its meaning and future.

Visiting and use of the river environment

Most of the interviewees walked along the Cole regularly, sometimes passing through on the way somewhere, but more often specifically to visit the area. Walking was often alone, sometimes with others or with a pet. Occasionally participants might spend time at particular spots, especially if they were with children, or partaking in volunteer activities. A couple of participants mentioned going to experience a specific aspect of nature, including bats on summer evenings, or the dawn chorus. Several talked about foraging / picking, mostly blackberries in late summer and wild garlic for cooking in spring; sloes and damsons were also mentioned.

Emotional and sensory relationships with the river

Participants described the river as a calming and therapeutic space, offering peace, reflection, and a respite from more stressful aspects of work and urban life. The presence of the river altered emotional states, with several participants noting a shift from stress to calm as they entered the riverside space. It was also noted that other people were more relaxed by the river and more likely to greet one another.

Sensory aspects were very important for this sense of community. Parts of the Cole feeling like the countryside was consistently reported, owing to the greenery and that buildings or roads are often set back and not easily visible. Participants talked about visual aspects like the play of light on moving water, reflections in the calmer reaches, and light dappling through leaves. The soundscape was clearly an essential aspect as well with relatively low traffic noise, and instead

the presence of birdsong and wind moving through the trees – willows were thought to sound especially nice. Participants also enjoyed how water sounded different in different places, according to depth and speed of movement, and the rushing sound at the stepping stones was particularly enjoyed. They also noted that the soundscape varied according to the seasons, including the amount of rainfall, flower emergence and leaf colours, so there was always something different in the experience. People said, for example:

"You've got a lot of birdsong, when it's just after dawn. And also I like the river sounds. There's so many pebbles in this river. You get this lovely trickling of water… that's relaxing"

"*I think what I like about the river is the ripples that I see. And the sound is really quite relaxing. The flow of the water off from the stepping stones, then the rushing sound that you hear, it's really quite calming."*

One person also talked about putting their feet in the water on occasions, but this was less common. While the natural and rural characteristics of the Cole was frequently mentioned, people also enjoyed some of the man-made features. Notably, the stepping stones were noted for creating water soundscapes (see above) and providing access across the Cole; and also the bridges in the Dingles area that had a picturesque quality – one person said that in winter in the snow they looked "like Narnia" and "quite magical".

Environmental observations and change over time

Participants placed high value on seeing wildlife in the area, and various species are enjoyed by participants (Table 1). Expectedly, there were varying levels of identification knowledge, but enjoyment was universal.

Table 1 – A collated list of species that walking interview participants reported to appreciate along the Cole

Squirrels	Ducks (mostly mallard)
Foxes	Herons
Badgers (Trittiford / Dingles)	Moorhens
Muntjac deer (Trittiford and Sarehole)	Coots
Water voles, possibly (Trittiford)	Egrets (Sarehole and Trittiford)
Bats – 3 species (Trittiford)	Cormorants (Trittiford pond)
Turtles / sliders ((Dingles)	Grebes (Trittiford pond)
Bullhead fish	Kingfishers (Sarehole, Dingles, Trittiford)
Minnows	Robins
Mayflies	Wrens
Interesting fungi	Woodpeckers
	Nuthatches (Trittiford)

Many participants had been living near the Cole for several years or decades and were able to discuss environmental changes that they had seen over time, encompassing the river itself and

surrounding ecology. Some changes were positive, but more were negative - Table 2 lists changes that were mentioned by any participant (not necessarily by multiple).

Table 2 – Environmental changes reported by participants during walking interviews

Positive changes observed	**Negative changes observed**
River floods less in the last 10 years	Butterflies, moths and insects in general greatly reduced
River is cleaner than around 15 years ago (but disagreement on this)	Blue damselflies specifically reduced
Signal crayfish reduced around Sarehole	Fish reduced, and sticklebacks no longer seen
More fungi as more dead wood left	Frogs no longer seen / heard (stretch upstream of Scribers' Lane)
	Hedgehogs far fewer
	Wildflowers crowded out by Himalayan Balsam
	Signal Crayfish seen (Trittiford / Dingles, previously Sarehole as well)
	River flowing differently and silting up, e.g. around Greet Meadow stretch

Participants linked these negative changes to pollution, climate change and reduced management from authorities. They did note though that the positive change of reduced flooding was due to management intervention in recent years.

Historical Layers

Several of the walking interview participants had a long personal history with this section of the Cole, and memories of earlier activities and interactions with the river and its ecology deepened their enjoyment and feeling of a relationship with the river. For others, aspects of the river resonated with past experiences in other places, for example:

"I come from a country where there's a natural lake. So I was born and brought up in water literally from childhood. So for me, wherever there is water, I kind of run to it."

Some participants were very knowledgeable about the history of the local area and of the Cole as part of that. They talked about the history of the mills and associated pools (Trittiford and Sarehole) especially. Most people valued knowing and learning about historical aspects and felt this was of value to the wider community.

In that regard, the ford at Green Road elicited some differing opinions. To some, it felt important to keep the last 'working' ford on the river open, for historical and cultural continuity. It was also pointed out that children enjoy seeing cars go through the ford. However, everyone who walked this stretch also discussed cars getting stranded and the difficulty of stopping people using it when the water was too high, despite new signage. One interviewee argued that it would be better closed to traffic so that it could be enjoyed more safely by pedestrians.

Antisocial behaviour and safety

Littering and to some extent fly-tipping was noted as being a problem along the river, but much more so along the Blackberry Way stretch. These were deemed to be major issues that affected enjoyment of the river environment and perceptions of the health of the Cole. Cuts in council services were noted by many participants as having affected the level of management, including the clearing of fly tipping and litter. Negative feelings were expressed towards the loss of park rangers, with the previous person holding this post being given high praise by many. Volunteers had to some extent taken on more responsibility for keeping paths clear and removing invasive species, and it was also noted that they were doing things that previously the ranger would have advised them not to for safety reasons, such as clearing giant hogweed.

Blackberry Way and to some extent the open area at the downstream extent of Greet Mill Meadows (close to Stratford Road) were generally felt to have a less pleasant atmosphere, and participants in general tended not to walk along these stretches. One participant linked these problems with levels of deprivation. Additionally, multiple interviewees mentioned homeless people sleeping in that area too, but did not feel that they were a safety threat, rather, that the homeless people themselves would be vulnerable.

At Blackberry Way in particular, a further major problem was drug paraphernalia including needles being regularly left along the paths and in the undergrowth. Owing to the drug use and also to some extent fear of mugging, most female interviewees from HGKIC said they did not feel safe to walk alone in that stretch. More broadly, two women from SEAT and FTPP said that they would not feel safe alone along the Cole, but they didn't feel unsafe in their local stretch of river upstream of Blackberry Way. The same participants also both commented that they would not let children go alone to the river these days and also mentioned concerns about needles. None of the male interviewees brought up safety concerns, and two explicitly stated that they did not have any.

Volunteering and Stewardship

Volunteering significantly deepened numerous participants' connection to the river. Some expressed a sense of guardianship and personal responsibility, and a positive feeling of taking action rather than just complaining. Several talked about the new knowledge they had gained, in particular through the Birmingham River Champions and the 'Urban Riverfly' technique specifically (see below). Participants discussed how volunteering had changed the way they saw the river, and difference in what they notice now. Several participants also described volunteering as a pathway to social connection and mental wellbeing. The following quotes captured these attitudes:

"I would definitely feel more of a connection [to the river]. I feel like a steward like I have to look after it. I feel, I feel that sense of responsibility."

"I never thought about the creatures in the river. It's like occasionally, you know if you looked over a bridge in the Dingles, you'd see some small fish and say, OK, you know, there are fish there. It

never occurred to me all these invertebrates, I'm seeing all these little shrimp and different things that are there, and the mayflies and so like now, it's like oh yes, three tails, mayfly. So you notice more, yes, yes."

"I think the the main thing is it's built more community feel and obviously you read this in books and all that. But actually you feel you belong somewhere. So for somebody who has actually come from outside, not that that's what I was looking for, this naturally happened."

However, it should be that multiple participants commented on how it was increasingly difficult to keep volunteer groups going, and in general, volunteering had declined since the COVID-19 pandemic.

Summary

The walking interviews revealed that studies sections of the Cole are deeply appreciated and meaningful to many. For participants, the river is not only a site of biodiversity but also a living social landscape shaped by personal histories, sensory engagement, and collective stewardship. Lived experiences and volunteer practices contribute to building an ethics of care, which is essential to sustaining the quality of the environment in a sometimes challenging urban setting.

River ecological and environmental health

Rationale and methodology

As part of the Birmingham River Champions, water chemistry and ecological surveys in the form Urban Riverfly were collected from four sites. For this, FTPP monitor Trittiford Park, while project lead Dr James White monitors The Dingles, Greet Mill Meadow and Blackberry Way. The latter is sometimes done alongside HGKIC volunteers, who once also sampled this site independently. Water chemistry samples were collected from October 2024, while Urban Riverfly surveys were taken earlier from May 2024 – samples from both techniques were collected up to February 2025 (at the time of community workshop – see below). Further information on these techniques can be found on the Birmingham River Champions website[1], but are summarised here. Key water chemistry parameters sampled include nitrate and phosphate, which are collected using Freshwater Watch kits - a national citizen science initiative organised by Earthwatch Europe. Ammonia and electrical conductivity are collected using separate instruments. Urban Riverfly is another national citizen science initiative whereby macroinvertebrate communities are sampled by volunteers disturbing the riverbed with their feet ('kick sampling') and collecting specimens in a net, which are then identified on the bank using bespoke information sheets. From this, the Anglers Riverfly Monitoring Initiative (ARMI) score can be calculated to indicate ecological health, with greater numbers of macroinvertebrates requiring higher water quality conditions raising ARMI scores. Conversely, more tolerant species resistant to pollution reduce ARMI values. Additionally, we used the River Invertebrate Classification Tool (RICT)[2] to estimate which macroinvertebrate species would be 'expected' to occur at each site if major human pressures were not present.

River Habitat Surveys[3] (which are not used in Birmingham River Champions) were collected at each of 5 Cole stretches outlined in Figure 1 during February, 2025. This is a UK-wide survey that entails trained personnel (Dr James White in this case) assessing the physical characteristics of rivers. It is undertaken along a 500-metre length of river, whereby observations on channel features and modifications are made at 10 equally spaced spot-checks, together with an overall "sweep-up" summary for the whole site. Two key scores are derived from this:

- Habitat Modification Score (HMS) - this quantifies the extent of engineered structures on rivers, with infrastructure like weirs and bridges leading to higher scores to indicate greater human impact.
- Habitat Quality Assessment (HQA) – this scores the diversity of habitat features, with greater variations in elements like bankside vegetation, flow types and riverbed sediment sizes scoring more highly. HQA were interpreted relative to semi-natural sites nationally that are otherwise environmentally comparable via a 'context analysis' – this compares measured scores versus 'expected' conditions (the same premise as RICT).

All last accessed 06/06/25:
[1]https://birminghamriverchampions.shinyapps.io/BirminghamRiverChampions/;
[2]https://www.gov.uk/government/publications/river-habitat-survey-guidance-manual;
[3]https://www.fba.org.uk/rivpacs-and-rict/river-invertebrate-classification-tool

Results and insights

Water chemistry

With the exception of nitrate and ammonia in The Dingles, there is a general increase in pollutant (electrical conductivity, ammonia and phosphate) concentrations moving downstream. Potential contaminant sources between sites include an unnamed tributary flowing through stables and Trittiford Pool (Trittiford Park-The Dingles), Chinn Brook, Coldbath Brook and Green Road ford (The Dingles-Greet Mill Meadow) and a misconnected outfall at Blackberry Way (see Figure 2b insert). The values presented in Figure 2 are the maximum values, and it should be noted that water chemistry observations were only sampled over a few months - longer-term observations would be required to better understand pollution pressures and how they change over time.

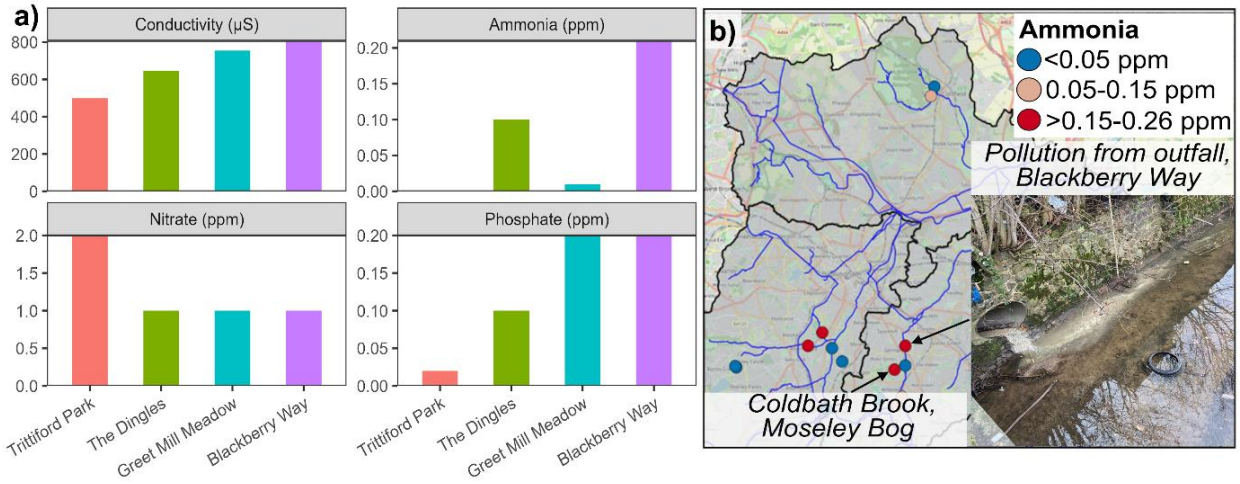

Figure 2 – Water chemistry results from Birmingham River Champions. a) Maximum concentrations of water chemistry parameters across different sites (upstream-downstream) along the Cole; b) An annotated map showing maximum ammonia concentrations across different rivers regionally, with notable sites in the Cole catchment highlighted. The insert image show pollution from an outfall at Blackberry Way.

Freshwater biodiversity

Urban Riverfly results revealed that ARMI scores are on average lowest at Trittiford Park, peak at the Dingles and decrease again downstream (Figure 3a). However, some macroinvertebrate species have only been found at Trittiford Park, and notably the flat-bodied stonefly (Heptageniidae – Figure 3b), which is an indicator of good water quality. These ARMI results likely reflect sampling differences (e.g., ferocity when kicking, visual estimates of abundance), with Trittiford Park being monitored by FTPP whilst others have been led or supported by university expertise. The Cole contains a lower species diversity than 'expected' if it were free from major human pressures (Figure 3b). Moreover, statutory Environment Agency sampling at Trittiford Park in 2014 indicated "poor" ecological conditions, with the number of species being 6-9% of that expected (i.e., compared to RICT predictions).

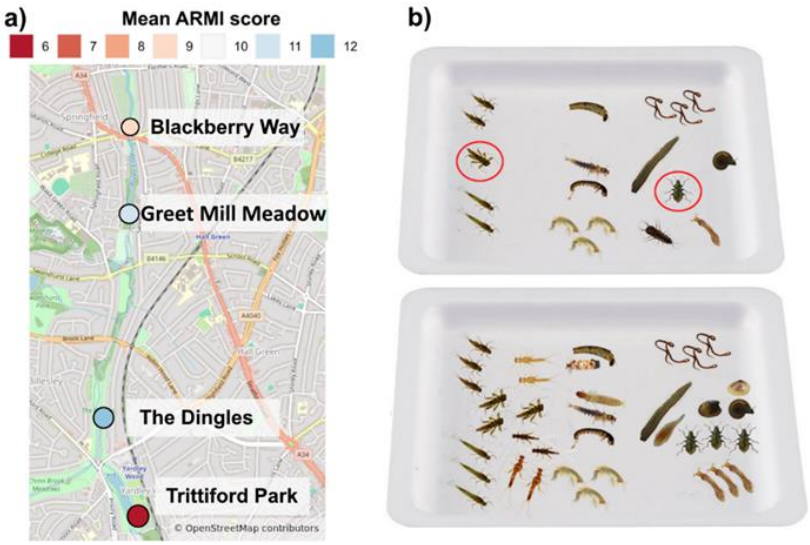

Figure 3 – Measures of ecological health along the River Cole. a) The Angler's Riverfly Monitoring Initiative (ARMI) score, with higher values designed to reflect better ecological health (but see text); b) Schematic illustrations showing the maximum number of macroinvertebrate taxa sampled at the Trittiford Park site (top), and those 'expected' to occur at the same location if it were to be free from major human pressure (bottom). The flat-bodied mayfly (Heptageniidae) and riffle beetle (Elmidae) have been circled as they have only been sampled at this location.

River habitats

River Habitat Surveys highlighted substantial human pressures on river channels (Habitat Modification Scores – HMS) and a low habitat diversity (Habitat Quality Assessment - HQA) versus national standards (including pristine, rural systems) – as indicated by their position in the 'red zone' in Figure 4a. The upper part of Trittiford Park possesses diverse habitat features like gravel 'bars' and meanders (Figure 4b), but next to parts of the mill pool becomes unnaturally straight and sluggish, with artificial bank protection ('gabion baskets' - Figure 4c). The Dingles has the least modified physical attributes, as reflected by lower HMS values (the most upper point in Figure 4a). Here, tight meanders promote habitat diversity and features like bars and 'berms' (Figure 4d), but physical modifications are still evident, particularly near bridges. John Morris Way is more confined, and notably bank erosion protection from housing reduces habitat naturalness and diversity (Figure 4e). Greet Mill Meadows displayed the highest HMS and HQA scores (the lowest and furthest left point in Figure 4a), meaning although it is the most physically modified (e.g., Green Road ford and multiple weirs – Figure 4f) it also possesses the most diverse habitats. Here, weirs and woody material create varying flows and habitats (Figure 4g), although the former reflects water being unnaturally held back before rapidly spilling over, and such obstacles restrict the movement of animals like brown trout. Blackberry Way possessed the lowest HQA values, which reflects its confined and straight nature. Higher HMS values here were caused by an extensive embankment on the left bank next to the allotments (Figure 4g – also note the amount of litter here) and unnatural banks in the upper stretch near to the Stratford Road.

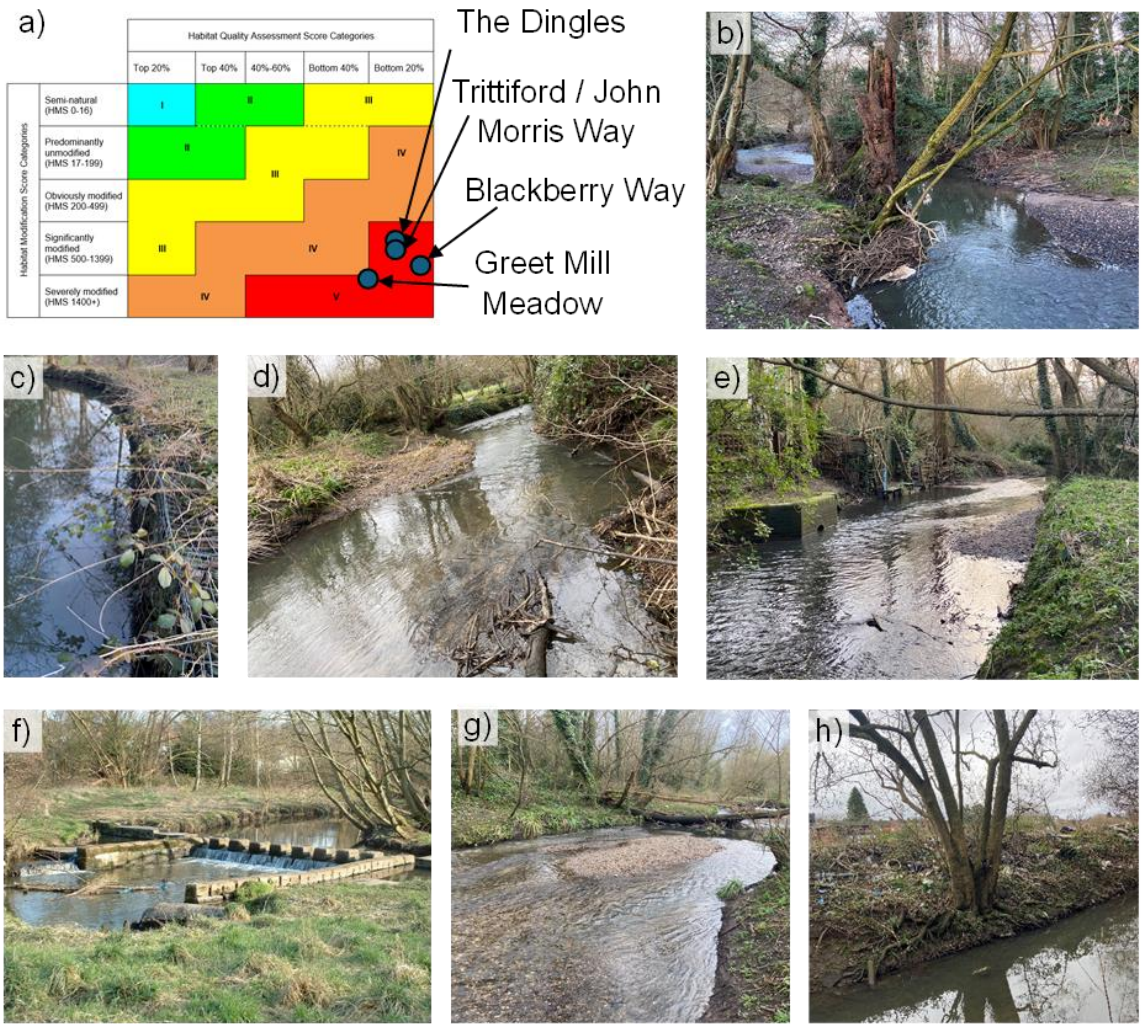

Figure 4 – Physical habitat characteristics identified by the River Habitat Survey. a) Human Modification Scores (HMS) and Habitat Quality Assessment (HQA) values of the Cole versus national standards; b) diverse habitats including gravel bars and fast/slow flows in the upper stretch to Trittiford Park; c) uniform, sluggish flows and gabion baskets in the lower stretch of Trittiford Park; d) variable habitats like fast/slow flows, woody material and a 'berm' (left bank) in The Dingles; e) bank modifications adjacent to homes in John Morris Way; f) the lower 'stepping stones' weir at Greet Mill Meadow; g) a mid-channel gravel bar and flow variations below a fallen tree in Greet Mill Meadow; and h) an embankment (adjacent to allotments) at Blackberry Way.

Summary

All of the environmental and ecological observations collected indicate a stressed ecosystem health relative to national standards. Within the context of the area of the Cole assessed, the evidence suggests an upstream-downstream worsening of ecosystem health that likely reflects water chemistry pressures. Physical habitat conditions were most diverse in Greet Mill Meadows and parts of The Dingles and Trittiford Park, but were notably low in Blackberry Way. Human modifications to physical habitats were most drastic at Greet Mill Meadows, Blackberry Way and parts of John Morris Way.

Community workshop

Rationale and methodology

The project team led a workshop with members of all three volunteer groups on Sunday February 23rd, 2025. The primary aim of this was to understand more about community values and priorities in relation to potential river restoration approaches, so that any future plans along the studied stretch of the Cole could be founded on these perspectives alongside environmental and ecological principles. The workshop built on the walking interviews, the results of which were presented to participants alongside environmental and ecological results (see above) for further discussion and reflection.

The workshop took place at Hall Green Community Church meeting space, close to the stretches of the river where volunteers operate. All members of the three volunteer groups were invited, regardless of whether they participated in a walking interview. In total, 21 participants attended, 17 of whom actively volunteer in the invited groups (seven from FTPP, three from HGKIC and seven from SEAT), while four additional delegates with active interests in the Cole and conservation attended. Four members of the University of Birmingham (UoB) research team ran the workshop, and Sally Clague from Birmingham and Black Country Wildlife Trust (BBCWT) attended and supported the event. Adam Noon, the regional catchment coordinator from the Environment Agency, was unable to attend but provided resources and fed in information.

The workshop was structured as follows:

- Welcome and introductions;
- Presentation summarising insights from the walking interviews (Dr Rosie Day, UoB) followed by a question-and-answer session;
- Presentation on environmental and ecological findings from the River Cole (Dr James White, UoB) followed by a question-and-answer session;
- Mapping exercise, where volunteers highlighted locations of interest, value and concern during the break (further details below);
- Two presentations delivered by Sally Clague, outlining the perspectives and aspirations of the Environment Agency (provided by Adam Noon) and BBCWT for the Cole;
- Prioritisation tasks, facilitated by the UoB team (further details below), where groups discussed and scored the level of importance and agreement to potential changes to the Cole and hypothetical restoration techniques;
- Feedback from groups and final discussion

Mapping exercise

A large map of the relevant sections of the Cole was printed prior to the workshop. Based on the walking interviews, the UoB team had added some annotations to indicate positive and negative issues, or notable observations that had been made at specific locations. Workshop participants were invited to add further notes expanding on or contextualising these existing annotations or indicate noteworthy reflections at other locations using post-it notes.

Group prioritisation tasks

For the prioritisation exercise participants separated into four roughly equal groups, each with a facilitator from the UoB team / BBCWT. This exercise comprised two prioritisation tasks.

For the first task, participants were provided with seven 'potential future attributes' written on post-it notes, and a piece of flip chart paper with a marked vertical scale spanning 'Very Important' to 'Very Unimportant', with 'Neutral' in the centre. They were asked to discuss each post-it and place this on the scale, with the possibility to add notes to explain why they placed these where they did, and whether there was any disagreement. This element provided an understanding of specific features that could be welcomed within a prospective restoration strategy, or conversely would be resisted or disliked. Volunteers were also encouraged to consider other attributes that they do or do not value and would hence welcome or oppose in a prospective restoration strategy, and to write those on additional post-its and add to the scale. The seven pre-written potential future attributes contained the following environmental and societal features:

i) Fewer invasive species (e.g. Himalayan Balsam, signal crayfish)
ii) More bird diversity
iii) More underwater plants, bugs and fish
iv) More flow variability: fast and slow
v) More access points to the waterside
vi) Keep the stepping stones
vii) Information boards on River Cole's history

For the second task, participants were given a set of 6 potential river restoration techniques, each as a card with a photograph and short description. Facilitators explained more about these as needed. Participants were provided a separate piece of flipchart paper with a scale marked on as a vertical axis from 'Strongly For' to 'Strongly Against', with 'Neutral' marked centrally. Participants were asked to discuss and place each of restoration technique on this scale. They could also add notes to indicate why they placed it where they did, and whether there was any disagreement. The seven potential river restoration techniques were:

i) Old Greet Mill weir removal (near to Stratford Road)
ii) Weir removal at the lower stepping stones (stepping stones could be retained)
iii) Bed levelling at the upper stepping stones (stepping stones could be retained)
iv) Green Road ford removal (remove concrete, raise banks, deepen)
v) Tree pruning / felling (more sunlight for plants)
vi) Digging out new meanders / channels
vii) Introducing woody material into the river (more habitats)

It should be noted for (iii), the upper stepping stones also form part of a weir that is smaller than the Greet Mill and lower stepping stones counterparts. The term 'bed levelling' was thus used to better distinguish between the weirs.

For both prioritisation tasks, we assessed the flip chart paper outputs and derived estimated numerical values to help visualise this data graphically (albeit recognising post-it note placement is not an exact science).

Results and insights

Prioritisation tasks

Based on observations from both the walking interviews and additional insights supplemented during the mapping exercise, various locations with issues or elements of interest were identified. These are indicated on the maps in Appendix A, but specific locations are discussed in the following text.

In the ‘potential future attributes’ prioritisation group task, biodiversity-related features such as controlling invasive species and promoting underwater ecological health (plants, macroinvertebrates, fish) and bird diversity were consistently identified as very important (see Figure 6). This highlights that local communities recognise the need to support ecological diversity at all levels, rather than just readily visible or iconic species. Retaining the two sets of stepping stones along Greet Mill Meadows was identified as moderate to high importance by all groups, reinforcing how these features are valued by local communities for different purposes (see Walking Interviews).

One group felt that displaying historical information boards should be a high priority, and others also deemed this to be important. This underlines the value of cultural heritage to local communities, and how this should be communicated to residents and visitors. Notably, various historical mills along the Cole are regionally iconic, as indicated by the “Cole Mill Walkway”, and certain volunteers displayed detailed knowledge of these historic structures.

Enhancing flow variability (areas of fast and slow velocity), which was framed in the context of potential ecological benefits in this exercise, was broadly met with neutrality in this exercise. Given that walking interview participants noted the enjoyment of flowing water sounds and the more serene aspect of calmer stretches, the neutral responses in the workshop suggest that existing flow variability along the Cole is felt to be sufficient for community enjoyment. Nevertheless, more changes in flow reflects a greater habitat diversity, which in turn can promote biodiversity that was of evident importance to participants, which one group specifically recognised.

Greater access to the water was met with varying responses, with one group (predominantly SEAT volunteers) feeling this to be important, while another (predominantly FTPP volunteers) stating strongly that this was unnecessary owing to plentiful areas where individuals can easily enter parts of the Cole already. With the other two groups displaying broad neutrality, these findings could reflect such attributes being ranked as less important compared to others. However, strong variations between groups may indicate perceptual differences based on local contexts, with fewer entry points along the Cole along parts of Greet Mill Meadows and Blackberry Way compared to Trittiford Park.

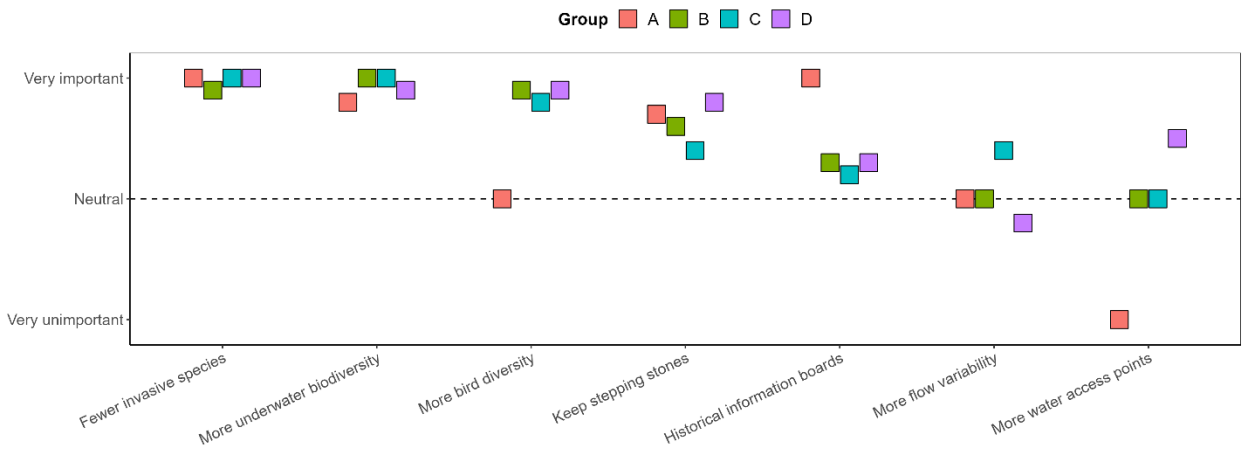

Figure 6 – A visualisation of post-it note placements in the 'potential future attributes' prioritisation task from the workshop.

In the same prioritisation task, volunteers also suggested various features beyond the seven initially provided. These were assigned to the following categories Environmental; Community engagement; Paths and riverside access; Litter; and Volunteer activity coordination (Table 3). Many of the environmental suggestions related to land-based (terrestrial) habitat features broadly, although some called for the existing artificial wetland upstream of Trittiford Park to be better maintained and expanded; this habitat was created by sluices being historically opened along the mill race. All groups made some comments or suggestions related to paths, with some suggestions of where specific improvements could be made, and highlighting that some paths require regular maintenance work to keep them clear of encroaching flora like brambles. A suggestion was also made though that there could be areas kept inaccessible by paths, for the benefit of wildlife. The importance of community engagement and means of delivering this was flagged in this exercise and was discussed throughout the workshop, and there was a notable desire for local residents to be consulted on management decisions along the Cole. Litter along the watercourse was also raised by various groups and was of particular concern along Blackberry Way. Some groups also reported the need for enhanced volunteer support and coordination along the Cole to help better support activities (e.g., litter picks).

Table 3 – Volunteer suggestions on potential future attribute changes or actions along the Cole.

Category	Potential attributes / actions	Group
Environmental	Wetland expansion [near Trittiford Park]	A
	[More] flowing water (sounds)	A
	Wildflower meadow planting	A
	More trees	B
	Create second channel (reduce flooding)	B
	Clear brambles to create glades	D
	Plant spring bulbs	D
Paths and riverside access	Protected areas [for] wildlife only	A
	Paths and riverside walks – Plastic paths in The Dingles [could be replicated elsewhere]	A
	Viewing platforms	A
	Meandering paths [running parallel to prospective new channel outline]	B
	Being able to see river	C
	Improve path to [lower] stepping stones	D
	Path maintenance [e.g. along track that links the two sets of stepping stones]	D
Community engagement	School engagement	A
	Bat walks at sunset	A
	Public consultation on restoration plans	B
Litter	Agencies to act on littering	B
	More managed bins and less litter in the Cole (especially along Blackberry Way)	D
Volunteer activity coordination	Initiate umbrella 'Shire Country Park' group	C
	More volunteer group funding	D
	Increase volunteer numbers	D

In the ‘potential river restoration techniques’ prioritisation task, volunteers were typically in favour of interventions that are likely to help improve the ecological health of rivers. Groups were strongly for the removal of the Greet Mill weir, specifically recognising how the large size of the weir presents a potential barrier to species like brown trout. Stronger community support for removing this weir also likely stemmed from its lack of aesthetic appeal and limited accessibility, especially when compared to the more visually engaging and accessible stepping stone counterparts.

Participants across groups were strongly in favour of new meanders and channels being fashioned, even with the initial disruptions to the landscape having been explained in the

workshop. One group outlined the importance of re-meandering channels to help reverse ‘canalisation’ of rivers.

The potential removal of both the lower and upper stepping stones weir was also reacted to positively, although participants responded more favourably to the former due to its larger size posing more of an ecological barrier (as above). It should be noted for both options it was specifically stipulated by two groups that the stepping stones should be retained as part of a weir removal strategy - reiterating the strong support flagged by all groups in the previous task.

Volunteers across different groups were broadly for tree pruning and felling in order to allow more sunlight into the channel that would increase the prospects of in-channel vegetation growth. However, some participants did highlight a need for caution given the different environmental and societal benefits that trees provide (e.g., habitats for birds, naturalness aesthetics) and one group stipulated that felling and pruning should be done “selectively” and “sensitively”.

Participants were typically in favour of woody material being introduced, although some expressed concern on how this could trap litter and potentially exacerbate local flooding.

The removal of the Green Road ford in place of a more natural riverbed was met with mixed views and some strong opinions. This reflected differences in opinions on the ford more broadly, with some deeming the issue of vehicle stranding to be an unnecessary social burden. Conversely, others enjoy the ford for its role as an access point as well as its cultural and historic value as the last functioning ford along the Cole. Some were in favour of the ford being closed to traffic, but others expressed concern that doing so would lead to this stretch becoming a focal point for litter and fly tipping. Some participants were not in favour of complete removal of the ford and deepening of the whole river channel, while others suggested that a narrower deep channel could be made to allow fish to move through.

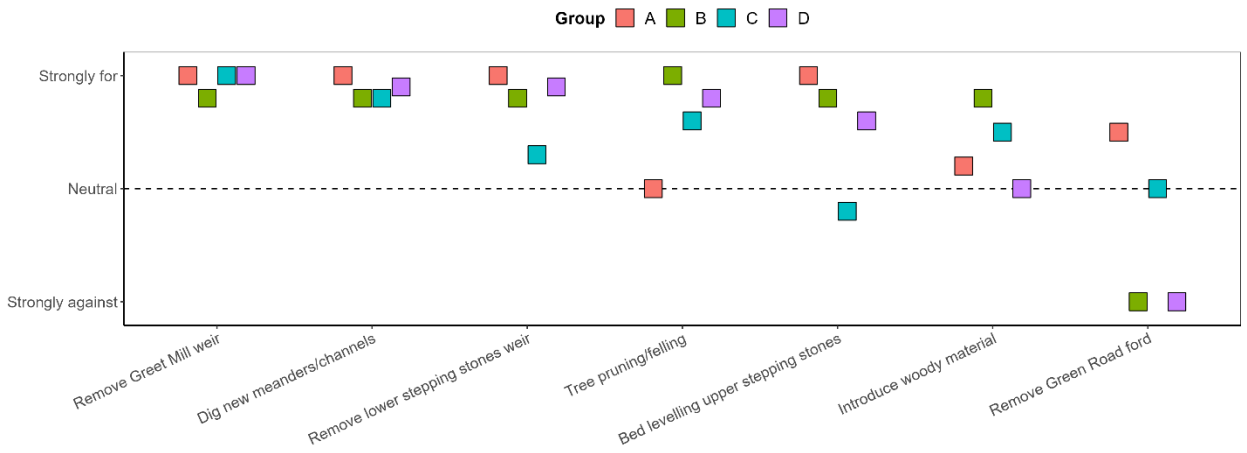

Figure 7 – A visualisation of post-it note placements in the ‘potential river restoration techniques’ prioritisation task from the workshop.

Feedback on the community engagement methods

At the end of the workshop, participants were asked to complete a short questionnaire to provide feedback on their experience of participating in the project, including the walking interviews for those involved.

Overall, community feedback was very positive. Those that participated in the walking interviews had enjoyed the experience, and several commented that doing so along the river had made them remember and consider things that they would have otherwise not highlighted. One person said it made them realise how much the Cole meant to them.

All participants expressed that they had enjoyed the workshop, with the ranking exercises and discussions being a highlight for most. Meeting other volunteers and hearing the perspectives of the research team, BBCWT and EA were also highly valued. Participants commented that they came away feeling motivated and inspired.

Towards the end of the survey, participants were asked whether they would like to be involved in creating future restoration visions along the Cole. Out of the 18 people that answered, 15 stated that they would like to be involved, two answered maybe, and one answered no as they did not live locally. We then followed up by asking whether participation in the project had influenced their answer to the previous question. For this, 13 out of the 15 that answered said yes, one said maybe, and only one said no, although this last response is presumably due to the participant already being motivated as they had said yes to future involvement.

Recommendations

This research highlighted that communities value and engage with the River Cole in various ways, and were broadly in favour of management solutions intended to improve the ecological health of the watercourse. This is an important finding given that river restoration solutions intended to (re)instate natural features and processes do not always align with societal needs.

This research highlighted a desire for local communities to be included in management decisions, and therefore we recommend that any restoration work aiming to balance the needs of people and nature should include public consultation elements. Broad river restoration suggestions that could be considered in future restoration plans based on the outcomes of this project are outlined below. However, we note that any future restoration plans would require more formal assessments and feasibility studies undertaken by qualified personnel alongside authoritative (i.e., Environment Agency, Birmingham City Council) approval and landowner permissions.

The downstream decline in river ecosystem health alongside increasing pollution concentrations reported along the Cole highlights that investigating and resolving water quality pressures will be key in terms of facilitating ecological recovery, which based on this research would be welcomed by local communities. Of particular note is the misconnected outfall at Blackberry Way, which is a primary candidate for degrading the ecological health here and is also a public health risk with abundant sewage fungus evident because of this.

In terms of river restoration plans aiming to improve the physical habitat complexity of rivers, amending or removing artificial infrastructure like weirs, bridges, fords and bank protection that are present across the studied area of the Cole should be considered. This project highlighted two key examples whereby restoration designs focussing purely on environmental outcomes may not align with community values. First, weir removal projects along Greet Mill Meadows should consider retaining the stepping stones to align with community interests, such as retaining flowing water soundscapes and connections across the Cole. However, rushing waters may be constrained after weir removal and additional measures like woody material could be considered to augment these sounds and potentially provide wider ecosystem benefits (but see below). Second, any changes to Green Road ford may require a greater level of public consultation and communication given the varying and strongly held views on this.

One notable habitat lacking across the Cole is the lack of in-channel and bankside vegetation diversity (although it should be noted River Habitat Surveys were undertaken during winter). This could be addressed *via* interventions like tree coppicing and felling that would allow more sunlight across the channel, which participants in this project were broadly in favour of. However, engaging with tree specialists and local groups would be key to minimising any unintended consequences of such interventions, and communicating plans publicly would likely help alleviate potential concerns of local river users towards tree cover losses. Such tree management could be considered alongside planting suitable native flora both in the channel (e.g., water crowfoot) or along the riverbank (e.g., water mint and brook lime), and complementary in-channel works to create appropriate habitat conditions. Such planting activities could be supported by willing volunteers alongside trained personnel and organisations, as demonstrated in a restoration project along the River Somer in Midsomer Norton (Bath)[1]. It should also be noted that as with the macroinvertebrate communities, in-channel plant recovery is likely to also be contingent on reducing water chemistry pressures.

Last accessed 06/06/25:
[1]https://www.therrc.co.uk/assets/pdfs/mot/Final_Versions_%28Secure%29/3.10_Midsommer_Norton.pdf

A lack of in-channel habitat complexity was evident in the lower reaches of Trittiford Park and parts of John Morris Way. Potential river restoration techniques here may be limited by the confined nature of the channels adjacent to residential areas (and Trittiford Mill Pool for the former). In such instances, manipulating habitats within existing channel outlines could be considered, including planting native flora (see above) or introducing woody material. For the latter however, there were some community concerns particularly surrounding these features being recognised as litter traps. Such interventions could therefore be introduced in more conspicuous locations, and again public engagement would be key to communicating the habitat, biodiversity and sensory benefits of woody materials creating tranquil and fast flowing areas. Potentially, coordinated actions with volunteer groups and focussed litter picks could be organised – similar community-based approaches have been undertaken in the urbanised Beverton brook in London[1,2].

In-channel habitats were also evidently simplified along parts of Greet Mill Meadows and most obviously along Blackberry Way. Here, channels have been unnaturally straightened, and alongside in-channel works (see above), these sections could benefit from more intensive restoration techniques modifying channel outlines (e.g., fashioning meanders). In these areas, this may also help move the Cole to footpaths to bring its benefits closer to public access. However, not all volunteers supported the need to create more water access points (although resistance was more apparent along Trittiford Park), but communities local to Blackberry Way may have stronger viewpoints when consulted on specific restoration plans. While participants in this research were generally in favour of new channels being fashioned, feasibility studies should consider the value of land being lost and also communicate plans to local residents, given this kind of intervention can initially look destructive.

Many of the community values held towards the Cole highlight the importance of river restoration actions encompassing a broader suite of approaches beyond just conventional techniques intended to enhance habitat diversity. Restoration plans should aim to enhance what people value, and support local communities' relationship with and ethic of care towards the river. We recommend that information boards containing both historical and environmental information along the Cole should be strongly considered as part of a restoration vision. It should be noted that some information boards do exist at areas like Trittiford Mill Pool and Sarehole Mill, as well as one recently constructed at Blackberry Way, but greater detail could be provided on aspects like the history of physical modifications of the Cole to accomodate mills - potentially drawing on John Morris Jones - and in-channel and bankside biodiversity of the river and threats it faces. Approaches like this will not only raise awareness of the Cole and its importance to surrounding neighbourhoods to help foster a sense of stewardship, but also helps create a place where people are more likely to access and enjoy.

This research highlighted that path maintenance restricting vegetation encroachment, particularing during the spring and summer months, is critical for local communities to be able to access the surrounding areas to the Cole. Currently volunteers are taking on quite a lot of the burden of maintenance, and ideally more support is needed from formal agencies, and more holistic restoration visions with longer-term visions could include strategies like this at relatively little expense.

All last accessed 06/06/25:
[1]https://www.wpcc.org.uk/latest-news/news/post/136-update-on-the-beverley-brook;
[2]https://www.southeastriverstrust.org/eat-sleep-restore-repeat/

Beyond potential restoration actions that could be implemented along the Cole, future engagement could build on the methods trialled here given how they were very positively evaluated. Participants valued being brought together and appreciated the opportunity to discuss with environmental experts and stakeholders. Communities were happy to commit their time as they found the experience enjoyable and also felt the project to be worthwhile. Both the walking interviews and community workshop yielded valuable insights into public values, and what would likely be more or less acceptable to river users in terms of restoration interventions. The dialogue between community members and professional stakeholders seems especially important for understanding different perspectives and deliberating possible solutions, which can help deliver a plan that everyone can support.

Conclusions

This project employed different public engagement strategies to explore how local communities values the River Cole, a highly valued urban watercourse in southern Birmingham. This was undertaken with the view to informing prospective future river restoration strategies that could deliver benefits for both people and natures. For this, walking interviews and a community workshop were used to capture the diverse ways in which volunteers—many of whom are active in the Birmingham River Champions citizen science initiative—interact with and value the Cole. Participants described the river as an essential green/blue space offering sensory and wildlife benefits within an urban environment. However, concerns around litter and antisocial behaviour, particularly in more deprived downstream areas, were also raised. The same stretches also displayed ecosystem health declines that are likely linked to more intense pollution pressures. The workshop showed strong support for restoration actions aimed at re-naturalising the river, although participants expressed their clear preferences for retaining key ‘stepping stone’ crossings and voiced mixed opinions about modifying the last working ford along the Cole at Green Road. Various recommendations for prospective future restoration actions along the Cole are discussed. More broadly, the public engagement methods trialled were well received and offer a promising approach for co-creating restoration plans that meet the needs of both people and nature.

Appendix

This appendix contains annotated maps of different stretches of the River Cole assessed within this project and key locations of interest raised by volunteers during the walking interviews and community workshop. The following images are a representation of the maps annotated by volunteers during the workshops. The maps are presented in an upstream-downstream (south-north) ordering.

Figure A1 – An annotated map of the River Cole along Trittiford Park.

Figure A2 – An annotated map of the River Cole along Trittiford Park and The Dingles.

Figure A3 – An annotated map of the River Cole along The Dingles and John Morris Way.

Figure A4 – An annotated map of the River Cole along John Morris Way and Sarehole Mill Recreation Ground.

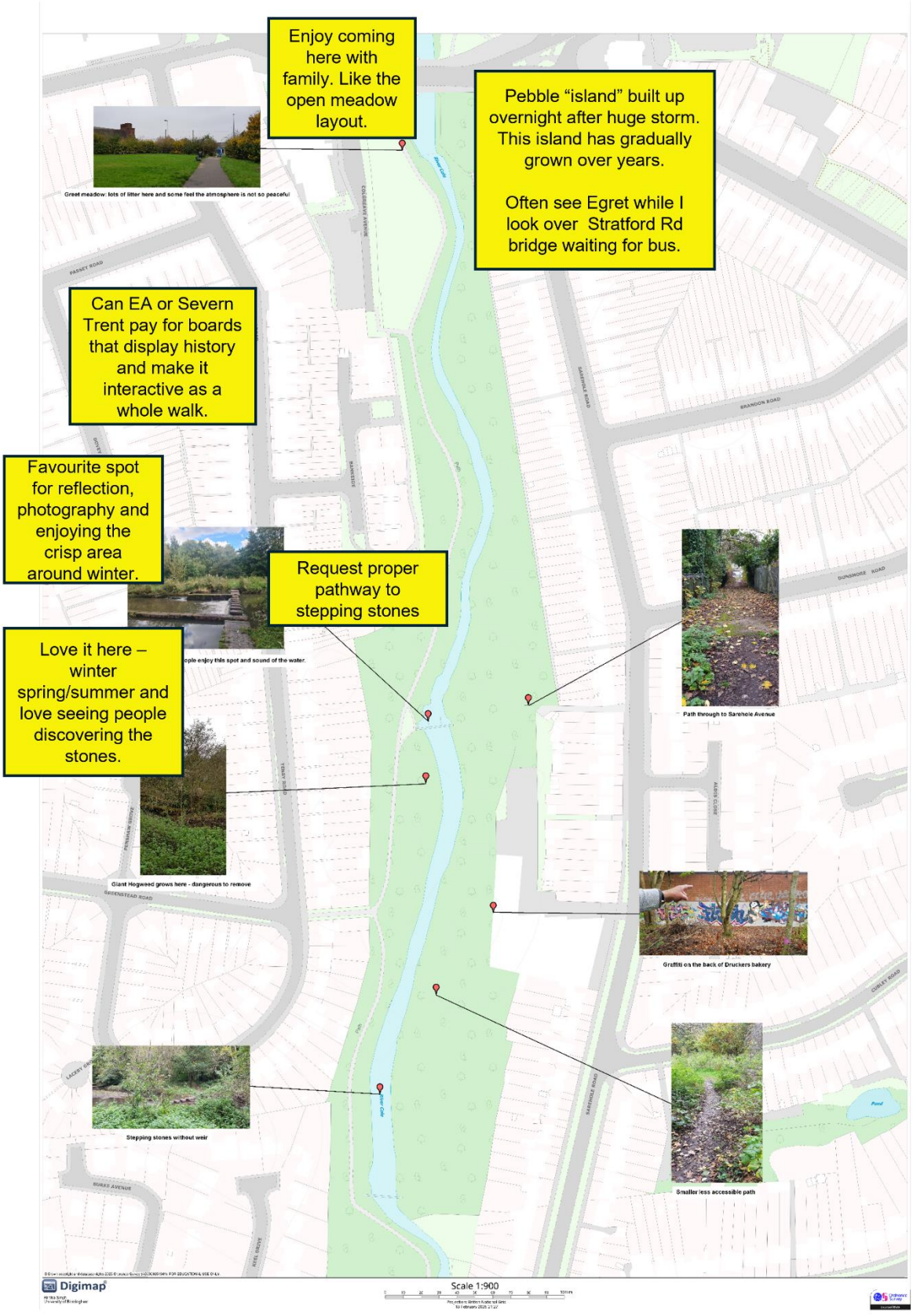

Figure A5 – An annotated map of the River Cole along Greet Mill Meadows.

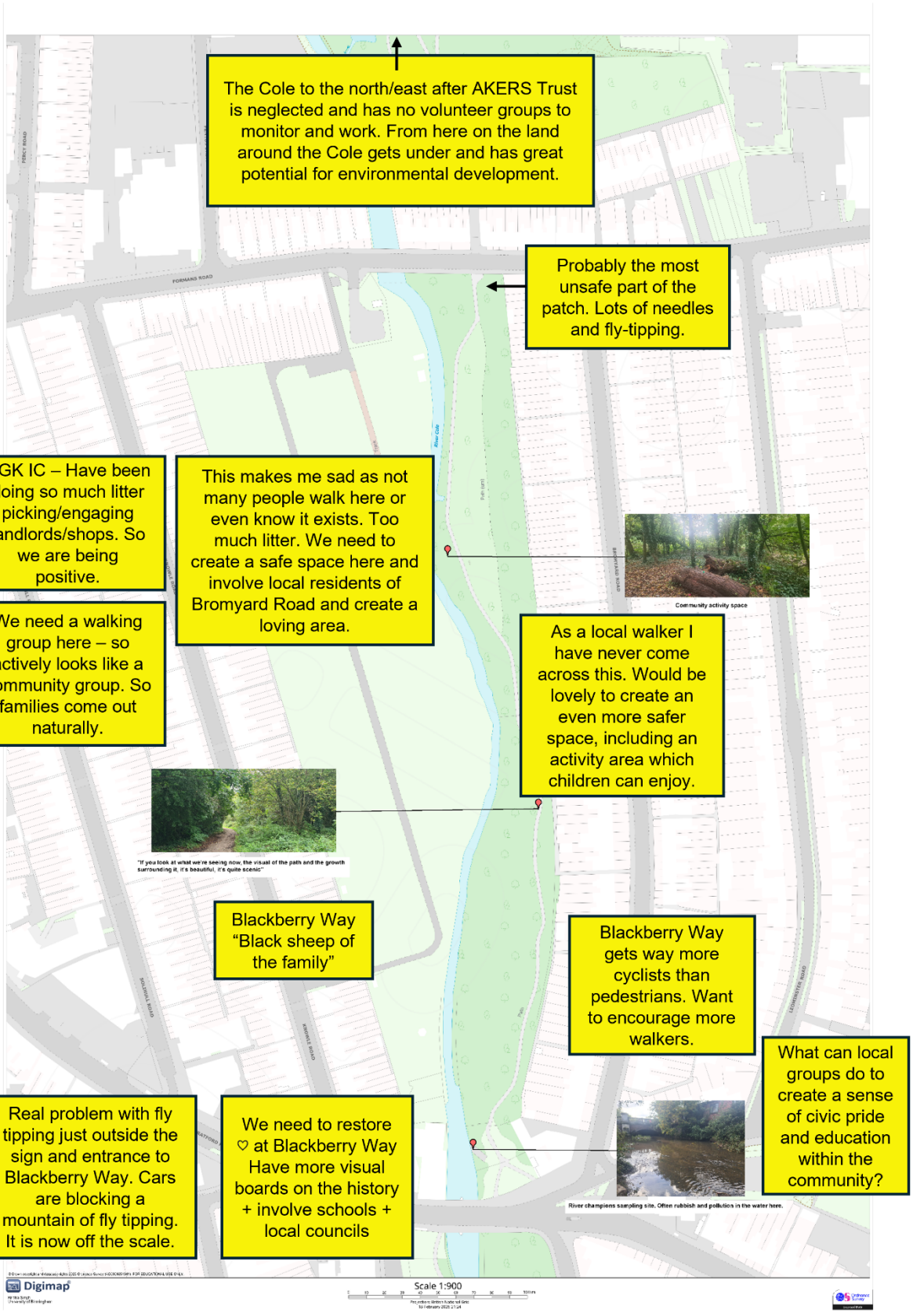

Figure A6 – An annotated map of the River Cole along Blackberry Way.