Yeading Brook Unbound: Draft Project Vision

Acknowledgements

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The Yeading Brook Unbound (YBU) Project

The aims of the Yeading Brook Unbound Project are to:

- Improve morphology to restore natural river function and increase resilience to flooding.
- Improve the in-channel river habitat to support greater biodiversity.
- Create additional habitat types that link to the riparian system.
- Map, control and gradually eradicate invasive non-native species (NNIPS).
- Connect local people with a more biodiverse urban landscape.
- Engage with communities and volunteers to transform the project area.

Purpose and Intended Audience

The purpose of this vision document is to help visualise the proposed works that will be carried out as part of the Yeading Brook Unbound project to encourage engagement and comment on the projects plans from interested stakeholders.

Key Definitions

Catchment: A water catchment is an area of land through which water from any form of precipitation (such as rain, melting snow or ice) drains into a body of water, such as a river, lake or reservoir, or even into underground water supplies (Ofwat, 2015).

Non-native invasive plant species (NNIPS): *also known as INNS (Invasive Non-Native Species)* are species which were introduced from outside the UK, which pose a threat to native flora and fauna through direct predation, out-competing native species or by negatively altering habitats.

Connectivity: Refers to the ease at which species can move between habitat patches, or describes the proximity and extent of barriers that might exist between habitat patches.

MoRPh Survey: Modular River (MoRPh) Surveys are used to characterise and assess the physical structure and function of a river.

Habitat heterogeneity: Describes the variation and diversity of habitats within a given area. High habitat heterogeneity is a major driver of increased biodiversity.

Incised channel: An incised stream/river occurs when a waterbody cuts its channel into the bed of a valley through degradation (erosion). As a waterbody incises its channel geometry becomes simplified and vertically contained, the stream/river becomes disconnected from its floodplains, and groundwater hydrology is altered.

Emergent macrophytes: Plants that live near the water's edge and along the banks of rivers.

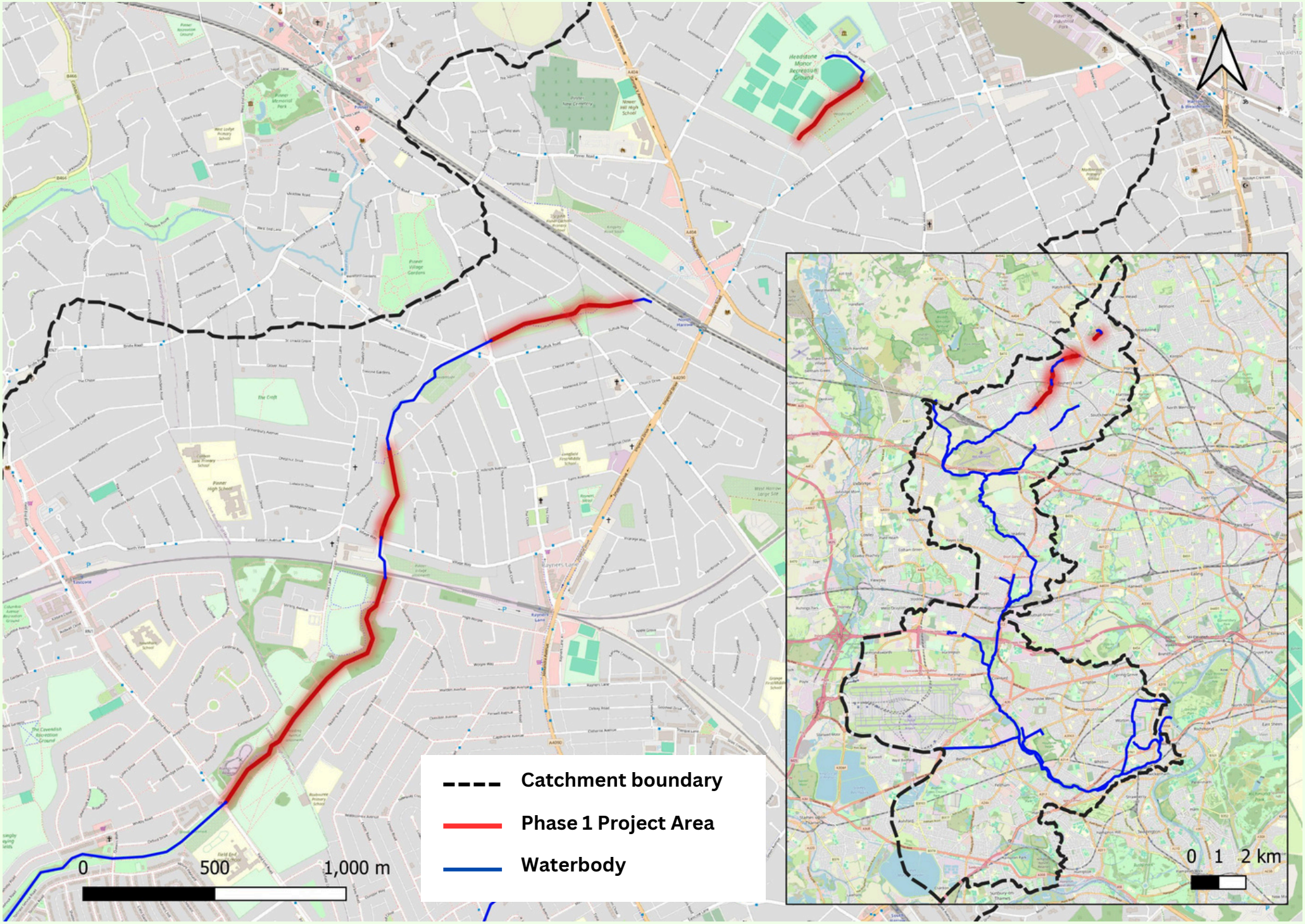
Project Area and Background

The Crane Valley catchment area covers roughly **125km²** and is home to over **650,000 people.** The River Crane Catchment extends across **five west London Boroughs**. The Crane headwaters start in Harrow as the Yeading Brook. Beyond Harrow, the river flows down through Yeading Brook Meadows and becomes the River Crane in the stretch of channel between Minet Country Park and Cranford Country Park. At Mereway Weir in Twickenham, the river splits into two channels, the artificial Lower Duke of Northumberland's River and the Lower River Crane, joining the tidal Thames in Isleworth.

Yeading Brook Unbound is focussed on green spaces along 2.4km of the western branch of Yeading Brook, at **Headstone Manor Park**, **Yeading Walk**, **Streamside Open Space** and **Roxbourne Park** (including the Hillingdon section). All are wholly or partly designated as **Sites of Importance for Nature Conservation** mainly thanks to the Yeading Brook. Dotted along this reach exists a **variety of habitats**, including **riparian** and **marginal wetland**, **open grassland**, **scrub** and **woodland**. There is great potential for YBU to further improve the habitat and unlock this section of river to the species that exist within the catchment, including **seven species of bat**, **water voles**, **kingfishers**, **Critically Endangered European eels**, **tawny owls** and many more **key native flora and fauna**. The project will also seek to **reinforce stream improvements** and **support nature's recovery** where practicable within the wider project area.

Like many urban rivers, the Yeading Brook suffers from **poor water quality**, **incised**, **narrow** or **artificial banks**, **lack of river heterogeneity**, **over-shading**, and **NNIPS infestations**. A MoRPh survey has highlighted where these problems are most acute and, importantly, where the river is in a relatively good state (Cartographer, 2023). These findings will help navigate the path of recovery towards a restored Yeading Brook.

Yeading Brook Unbound Project Areas



Project Priorities: A Phased Approach

The MoRPh survey highlighted potential interventions along the Yeading Brook, including: (1) Removal of invasive non-native plants, (2) Clearance of building materials and other waste from the river bed, (3) Opening more of the stream to light, and (4) Improving the diversity and abundance of river bed and marginal features. Such interventions will be undertaken via a phased approach.

Phase 1 will comprise of interventions within the four main target sites outlined in this document. These were chosen to maximise the ecological benefits whilst making the most of the funding available for works to be implemented in 2024.

Phase 2 will consist of follow-up works to further increase the ecological value within these target sites. These will be planned alongside the detailed design for Phase 1, but will require additional funds to be secured.

Phase 3 will seek to identify and implement further major improvements highlighted by the results from Phase 1/2 interventions or where the presence of certain NNIPS requires these to be eradicated before works might commence.

Legacy Preparation

YBU intends to deliver lasting change and provision has been made within the budget to support actions, particularly through awareness-raising, community engagement, training provision, volunteer development and group activities. These will seek to encourage and enable participation, e.g. in planting, monitoring and wildlife recording to assess the interventions in the wake of each and helping to ensure Phases 1-3 each achieve as much as possible in supporting nature's recovery within Harrow - and downstream. Putting people of all ages and local communities at the heart of the project, providing better opportunities for residents to participate in improving access to nature and other ecosystem service benefits, will be key to shaping the Yeading Brook Unbound legacy – making a positive and lasting difference for all.

Additional Improvements Across the Project Area

In conjunction with the larger scale interventions at the four target sites, improvements to the stream's channel, banks and margins will be implemented at a smaller scale, involving local residents with their river wherever possible. This will include:

- Managing vegetation through activities such as the pruning, pollarding and selective removal of trees and shrubs to reduce and prevent overshading.
- Adding gravel and cobbles into the stream.
- Vegetation enhancement through planting wetland plants, seed sowing and aftercare.

Many of these improvements will be in locations that are visible to the public (or can be made visible through vegetation management where appropriate) so as to improve local engagement with the river and its banks, whilst protecting sensitive areas and species from disturbance. One example will be to continue collaborating with volunteers from Hillingdon to eradicate the damagingly invasive Himalayan balsam from Roxbourne Park. Another possibility might be to create banks suitable for kingfisher to nest in.

Phase 1 Project Areas

1. Headstone Manor Park Flood Relief Basin
2. Yeading Walk
3. Streamside Open Space
4. Roxbourne Park

0 500 1,000 m

1 Headstone Manor Park

Priority Interventions:

- Construction of a scraped out pond within the existing flood relief basin. These flood storage basins were excavated in 2020 to hold water for short periods during high rainfall. This prevents flooding downstream. The new pond will be ~20m x 30m in size to account for draw down in dry conditions. The pond would remain wet for the majority of the year with the aim of creating additional flood storage and habitat. The pond will be fed by the stream and water will input from the from the flood relief channel. Flow will be diverted (will need to be modelled) through a leaky dam like system that will divert water flowing over 'moderate' conditions. This will prevent the stream drying out and only divert when there is enough flow to do so.
- Excavate a diverted meandering channel within the basin system and dig out smaller scrapes adjacent to these meanders.

Additional Phase 1 Interventions (subject to design):
Potential for bank reprofiling on the left bank of the stream alongside the allotments upstream of the flood relief area – with scope to reshape the bank and increase sinuosity.

2 Yeading Walk

Priority Interventions:

- Light needs to be let into the stream via strategic vegetation management to allow instream and bankside vegetation to thrive. Work has commenced with the non-native cherry laurel but more will be required because much of the river is over-shaded.
- Removal of NNIPS - specifically bamboo and Japanese knotweed.
- Scour the bank where possible to restore a more natural bank profile. There is enough space to regrade the bank and plant with a native water-edge seed mix. For one suitable area that has been identified, some additional targeted tree management will be required.
- Remove redundant concrete structure that is restricting the “naturalness” of the channel.

3 Streamside Open Space

Priority Interventions:

- Strategic vegetation management to allow more light into the river and allow marginal vegetation to grow.
- Installation of large woody debris/pinned trees/deflectors at suitable locations (could be achieved through felling and pinning local trees that have been strategically cut).
- Removal/treatment of NNIPS, specifically Japanese knotweed.

3 Roxbourne Park

Priority Interventions:

- NNIPS removal (specifically Japanese knotweed) along this section of river.
- Allow more light into the channel through the selective vegetation management.
- In this area, river sinuosity is restricted and there are areas that would benefit from adding large woody debris and trees felled from site that will be pinned in place.
- Removal of artificial bank reinforcements. Sections of the channel have toe boarding, tyres pinned to the channel edge or concrete sand bags. These all restrict the stream's natural form and function. Whilst reinforcements immediately upstream of bridges will need to be retained to prevent damage to bridge structure, toe boarding, tyres and sand bags elsewhere will be removed. Smaller gravels will also be added to the channel bed at these sites.
- Potential regrading of a section of the river bank (~6.5 to 7m width) to improve lateral connectivity. This can be enabled by pushing the path back somewhat from the edge of the stream allowing the regraded section to be planted with a mix of native wetland seeds and plants.

Improvement Methods

Marginal Planting

- Native plants along river banks are very important as their **roots provide bank stability** and **prevent soil erosion**, especially during flood events as well as **capturing nutrients** that would otherwise wash into the water course.
- Established marginal plants **provide food and habitat for wildlife**, including insects such as damselflies and water beetles, fish, birds such as the increasingly familiar little egret, and mammals including otter and the once common but now Endangered water vole.
- Marginal plants often form **locally distinctive plant communities** of wild flowers, sedges, rushes and grasses.
- Native **emergent macrophytes** play a key role in interacting with the river to build a more diverse suite of physical habitats.

Substrate Enhancement

- The addition of mixed gravel substrates (gravels, cobbles etc.) as well as the removal of unsuitable substrates can help to **raise the level of riverbeds, narrow, over-widened channels and restore natural river function**.
- Enhancing substrates can improve riverbeds by **creating varied flows** and features such as riffles and pools. In turn, this builds a **range of habitats** for species such as fish and invertebrates, providing **refuge, spawning and feeding areas**.
- Gravel sizes and retention techniques can be experimented with to establish the best mix to reduce substrates being washed out while providing maximum benefits for flow regimes and biodiversity.

Managing Vegetation

- Riparian/bankside vegetation provides a number of benefits to rivers. However, by excluding light from the channel, **excessive over-shading can also be detrimental to the quality of the river habitats**. This can shade out the aquatic and marginal vegetation, vital in supporting greater biodiversity, and lead to bank destabilisation.
- Rotational coppicing, pollarding and crown raising of marginal trees, along with sapling thinning, facilitates **increased light penetration** to the river. This **promotes the growth of marginal and aquatic vegetation**, **improving biodiversity** and creating and maintaining **diverse and valuable habitats**.
- It is vital that riparian **vegetation management is sensitive and selective** to **support interactions with the river** to build a more diverse suite of physical habitats. Mature native trees and related naturally-fallen trees and large wood pieces are for example vital in supporting physical habitat diversity and dynamics.

Non-Native Invasive Plant Species (NNIPS) Management

- Non-native plant species can be a particular problem in and around water, as they are often fast growing, easily spread and proliferate within a short time frame. Left unmanaged, they can **outcompete native flora**, **increase over-shading** and lead to significant **biodiversity loss.**
- The main NNIPS along the Yeading Brook include Japanese knotweed, bamboo, rhododendron, Himalayan balsam and cherry laurel.
- Removal of NNIPS species will promote more marginal and aquatic plant growth, supporting a wider range and greater abundance of native wildlife.

Creating Wetland Features - Ponds and Scrapes

- Standing water features within a river catchment add significantly to the habitat heterogeneity of the riparian zone, with variations in size, depth, topography and degree of connectivity adding further to their value.
- The conditions associated with each water body determine what species it might support and can therefore result in distinctly different communities.
- Permanent ponds usually hold water throughout the year, whilst shallow scrapes and other ephemeral ponds often dry out completely during summer months with the resulting absence of fish making them particularly attractive to breeding amphibians.
- Excavation and enhancement of new water bodies provides an effective way of adding to site biodiversity value.

Creating Wetland Features - Backwaters

- Backwaters are small branches of a river where there is little or no current.
- These increase the **habitat heterogeneity**, **offer refuge to species during low flows** and can i**ncrease the flood storage capabilities**.

Removal of Redundant Artificial Bank Reinforcements

- Historic river modifications have **trapped and channelised** urban rivers, limiting their connectivity to the floodplain and preventing natural river function.
- Typically, these consisted of wooden toe boarding, rock walls or concrete channels and beds and many are now in a state of disrepair.
- Breaking sections of river out of concrete or timber constraints can **restore natural flow regimes**, **improve connectivity** to the floodplain, and **magnify the benefit of other in-channel improvement techniques**, such as re-meandering, backwater creation and deflector installation.

Addition of Large Woody Debris (LWD) and Tree Pinning/Wood Deflectors

Bankside, toppled trees and dropped branches are an important constituent of natural riverine systems. Adding wood to a heavily modified, urbanised river can contribute significantly to waterway restoration and enhancement.

Large Woody debris (LWD)

LWD creates diverse habitats within the river, supporting a wide range of aquatic and terrestrial species. LWD slows down the water flow, allowing sediment to accumulate, which in turn provides breeding and feeding grounds for fish and invertebrates. This natural process also contributes to the stabilisation of riverbanks, reducing erosion and improving water quality by filtering pollutants.

Tree Pinning/Wood Deflectors

Suitable placement of pinned trees/ wood deflectors can redirect water flow to mitigate issues such as a lack of river sinuosity, a common issue in urban rivers. By creating varying flow patterns, deflectors enhance habitat complexity, promoting biodiversity. Wood deflectors contribute to the re-naturalisation of the river's physical structure, encouraging the development of meanders and pools that are essential for a healthy river ecosystem.

Bank Re-Profiling

Bank re-profiling is an in-channel and channel margin practice that may be used to:

- Improve or restore uniform, over-steep or trapezoidal channels to a more natural form.
- Enhance ecological function by enabling riverbanks to support a wider range of plant and animal species.
- Re-establish meanders, natural river function and flow patterns - mitigating the problems associated with heavily modified and channelised rivers, e.g. increased water velocity (leading to flooding), reduced instream and bankside habitat diversity.
- Introduce two-stage banking that can better handle low summer flows and reduce wintertime flood risks.
- Improve water quality by reducing erosion and sedimentation, leading to healthier aquatic ecosystems.
- Boost overall river health.

Engaging with Local Communities Through the Yeading Brook Unbound Project

There are a number of local groups already active within the YBU area. These include constituted Parks User Groups - the **Friends of Headstone Manor Park**, **Friends of Yeading Walk** and **Friends of Roxbourne Park** that each focus on particular locations and form part of the **Harrow Parks Forum**. Alongside these is the **Harrow Nature Conservation Forum** which, through its Harrow Streams project and Harrow Wildlife Action initiative, takes a more wide-ranging approach.

These local organisations have been involved since project inception, helping to inform project design and they will play a key role in project promotion and practical improvement activities (including deflector pinning, wetland planting and the removal of NNIPS). Additionally, other groups of volunteers at **Woodlands Open Space** and **Streamside Open Space** have begun to get involved with practical tasks.

The project will seek to recruit existing volunteers from within these partnering groups as well as new local volunteers who will be trained to assist with practical conservation works, biodiversity sampling, hydromorphological surveying and the follow up monitoring of project interventions. Their observations will contribute to the bigger picture of monitoring along the Crane river system and other UK rivers, which will also serve to put the local situation - and changes resulting from YBU into context.

Getting Involved!

If you're interested in getting involved with these activities or helping your local group, please email **biodiversity@harrow.gov.uk** to let us know what and which site interests you most. Providing feedback on changes, helping with design, communications or coordination to help activities run smoothly and ensuring everyone is getting the most out of opportunities can be just as important as recording wildlife or being involved with practical tasks yourself. If you're keen to help make a difference we'd be delighted to hear from you.

Project Timeline and Next Steps

Several steps are planned for delivery within YBU Phase 1. Firstly, preparatory vegetation clearance and implementation of the plans/key activities identified for target Phase 1 sites will be appointed to specialist contractors. These specialist contractors will be experienced in carrying out the ecological restoration of waterways and pond creation. Following this, public consultation will be carried out while detailed plans are finalised. For works liable to affect water flow along those sections of the Yeading Brook that are classified as main river and come under the Agency's jurisdiction, a Flood Risk Activities Permit (FRAP) application will be submitted to the Environment Agency. This process can take 13+ weeks. Following FRAP, approval the main Phase 1 works will commence in late summer/autumn.

As we build the detailed design for what can be funded through the available budget, we will also draw up outline designs for the later phases.

<table>
<tr><th>2024</th><th>Community Focussed Activities</th><th>Project Coordination</th><th>Preparatory Works</th></tr>
<tr><td>March</td><td>Share Vision Document</td><td>Approach specialist contractors</td><td>Draft training and event programme</td></tr>
<tr><td>April</td><td>Public Consultation</td><td>Tender design and build contract</td><td>Identify project opportunities beyond Phase 1 target sites</td></tr>
<tr><td>May</td><td rowspan="4">Volunteer activities. e.g. 'Rubble Trouble' clearances, Himalayan balsam 'lambasting', wildlife surveys.</td><td>Appoint contractors</td><td>Submit bid to CVP for Phase 2 works</td></tr>
<tr><td>June</td><td>Design finalisation and FRAP application</td><td>Agree outline designs for Phases 2/3</td></tr>
<tr><td>July</td><td rowspan="2">Non-FRAP works</td><td>Begin Japanese knotweed control</td></tr>
<tr><td>August</td><td>Submit bid to EA for Phase 2 works</td></tr>
<tr><td>September</td><td>-</td><td>Phase 1 Ground Works begin</td><td>Submit Phase 2 FRAP application</td></tr>
<tr><td>October</td><td>Seed sowing</td><td>-</td><td>Plan follow up</td></tr>
<tr><td>November</td><td rowspan="2">Bankside and wider tree and shrub planting</td><td>Phase 1 Ground Works complete</td><td rowspan="2">Submit bid to RLF for Phase 3 works</td></tr>
<tr><td>December</td><td>-</td></tr>
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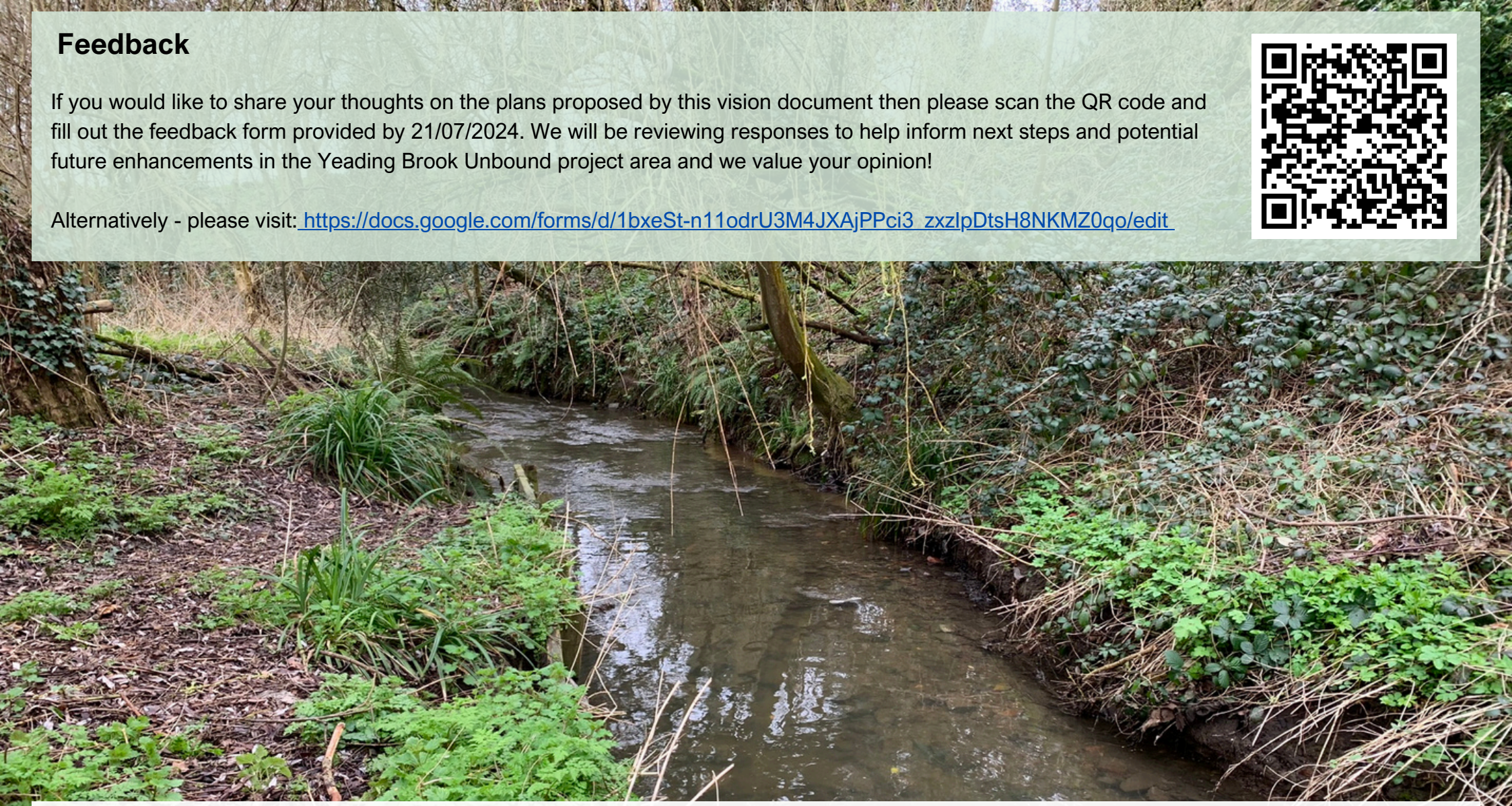
Feedback

If you would like to share your thoughts on the plans proposed by this vision document then please scan the QR code and fill out the feedback form provided by 21/07/2024. We will be reviewing responses to help inform next steps and potential future enhancements in the Yeading Brook Unbound project area and we value your opinion!

Alternatively - please visit: https://docs.google.com/forms/d/1bxeSt-n11odrU3M4JXAjPPci3_zxzlpDtsH8NKMZ0qo/edit



With additional thanks to Harrow Parks Forum and Harrow Nature Conservation Forum:

Harrow Parks
making friends and inspiring people

Harrow Nature Conservation Forum