

# what we are doing

seeking your thoughts to help inform us

Woking Borough Council has appointed Landscape Architects **BDP** and Environmental Engineers **Waterman** to develop proposals for the 'Hoe Stream Restoration Project'. The project is located upstream and downstream of the existing flood defence scheme completed in 2012.

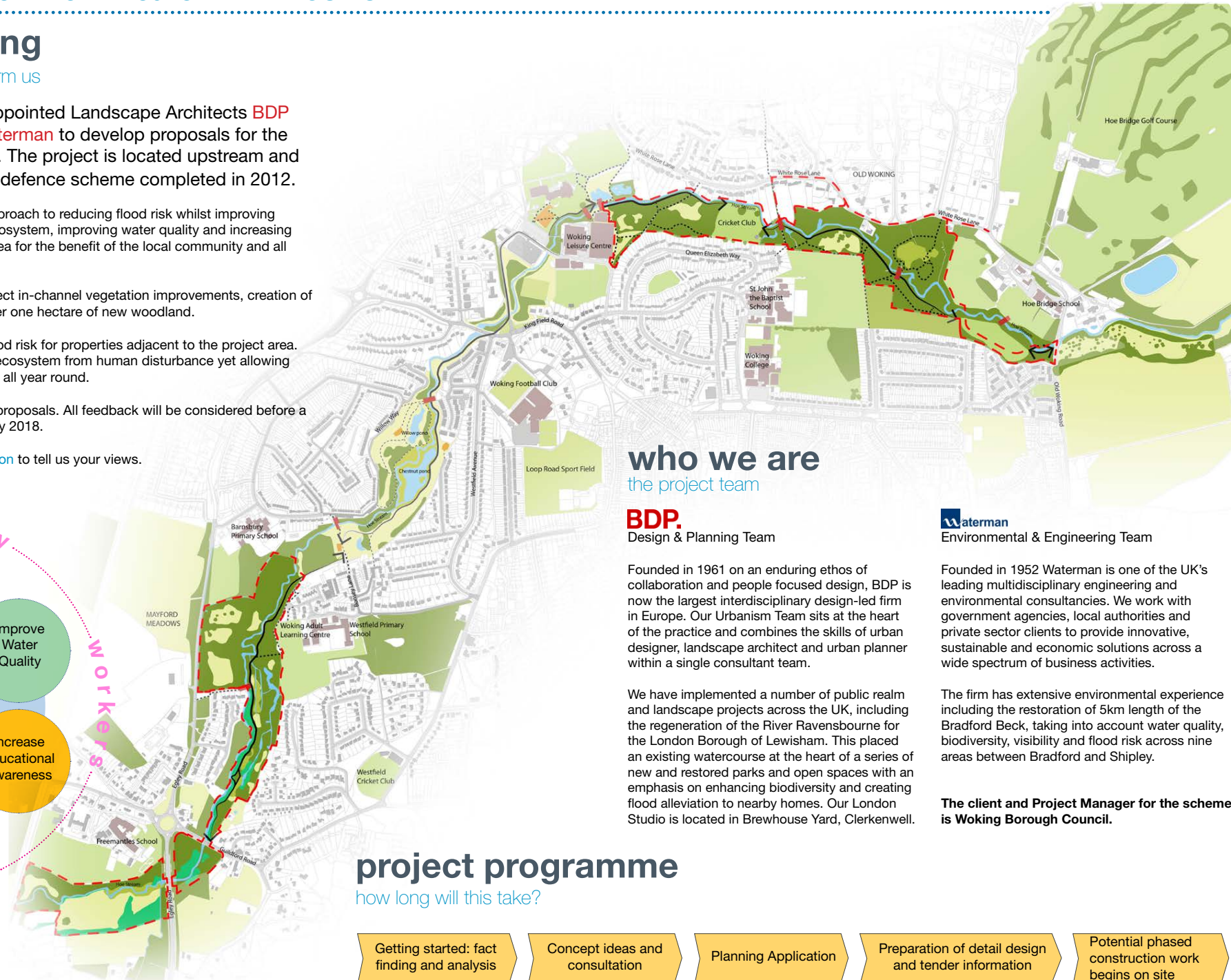
The proposals seek to take an integrated approach to reducing flood risk whilst improving accessibility for all, establishing a diverse ecosystem, improving water quality and increasing recreation and educational facilities in the area for the benefit of the local community and all residents who reside within the Borough.

On completion of the project, we would expect in-channel vegetation improvements, creation of new wetlands along the Hoe Stream and over one hectare of new woodland.

The restoration project will aim to reduce flood risk for properties adjacent to the primary area. New routes will be organised to protect the ecosystem from human disturbance yet allowing cyclist and walkers to access the area safely all year round.

We are now keen to hear your views on our proposals. All feedback will be considered before a formal planning application is submitted early 2018.

Visit [www.woking.gov.uk/hoestreamrestoration](http://www.woking.gov.uk/hoestreamrestoration) to tell us your views.



## who we are

the project team

**BDP.**  
Design & Planning Team

**Waterman**  
Environmental & Engineering Team

Founded in 1961 on an enduring ethos of collaboration and people focused design, BDP is now the largest interdisciplinary design-led firm in Europe. Our Urbanism Team sits at the heart of the practice and combines the skills of urban designer, landscape architect and urban planner within a single consultant team.

Founded in 1952 Waterman is one of the UK's leading multidisciplinary engineering and environmental consultancies. We work with government agencies, local authorities and private sector clients to provide innovative, sustainable and economic solutions across a wide spectrum of business activities.

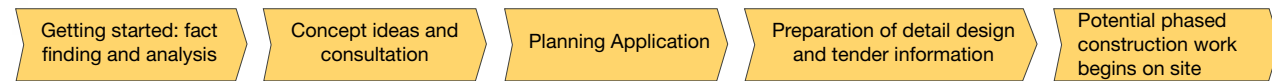
We have implemented a number of public realm and landscape projects across the UK, including the regeneration of the River Ravensbourne for the London Borough of Lewisham. This placed an existing watercourse at the heart of a series of new and restored parks and open spaces with an emphasis on enhancing biodiversity and creating flood alleviation to nearby homes. Our London Studio is located in Brewhouse Yard, Clerkenwell.

The firm has extensive environmental experience including the restoration of 5km length of the Bradford Beck, taking into account water quality, biodiversity, visibility and flood risk across nine areas between Bradford and Shipley.

**The client and Project Manager for the scheme is Woking Borough Council.**

## project programme

how long will this take?



Summer 2017

October 2017

February 2018

March 2018

2019



## what are we trying to achieve

why are we doing this?

The Hoe Stream Restoration Project is a multi-beneficial scheme that takes an integrated approach to watercourse design and management. There are a number of key reasons why Woking Borough Council is undertaking this initiative:

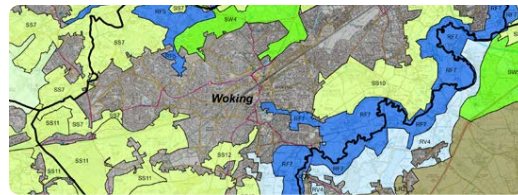


### Unify with previous enhancement works

The Council is seeking to realise a long term ambition to restore and enhance the ecological diversity and strength of the Hoe Valley.

It is seeking to build on the successes delivered by the first phase of the scheme in the Westfield area completed in 2012 by undertaking further enhancement works to areas both upstream and downstream of the existing scheme.

This will ensure that the natural corridor linking Old Woking and Mayford is truly integrated with its urban environment and reinforced as a desirable place to visit and to travel through.



### Build upon research and analysis

A significant amount of research has been carried out and collected as part of the initial stage of the project to provide an informed assessment of the proposals that can be delivered and to highlight any constraints.

A series of ecological surveys have also been carried out. These include mammal, fish, water corridor surveys and phase 1 habitat survey. Through this combined data, it has become evident the area is declining in terms of ecology and its habitat. The Hoe Stream has not reached Good status in terms of the Water Framework Directive whilst the stream is also heavily impacted by non-native invasive species such as American Mink, Himalayan Balsam and Signal Crayfish and has also been heavily modified in sections.

The project has the opportunity to address these issues to improve ecological habitat, both alongside and within the watercourse.



### Flood risk alleviation

The project is to be carefully designed so that it helps reduce flood risk to properties in the surrounding area. It will assess water 'high flow' (flooding conditions) but also the impact of water 'low flow' (drought conditions) which can have a significant impact on the river corridor and its ecology. It will incorporate dual functioning measures to help mitigate the impact of both conditions on the local area.

These measures will help reduce flood risk but at the same time also provide water quality and ecological benefits. They can include wetlands and reed beds to treat surface water runoff and overflows from the sewer system and attenuation basins / ponds to store excess water which is then released back into the river at a restricted rate. Two-stage channels can provide extra capacity during a storm event and flood embankments set back from the watercourse can provide further protection and ecological benefits, such as holt habitat for otters.

The project also presents the opportunity to test the resilience of the 2012 flood alleviation scheme against revised climate change allowances.



### Ecological habitat improvements

There are significant areas of valuable existing habitat and publicly accessible spaces within the project area that the Council wish to retain and continue to manage as they are.

However, the analysis and survey data indicates that there are numerous areas within the Hoe Valley that are suitable for ecological enhancement. The area has the potential to improve habitat for species including bats, water voles, otters, aquatic invertebrates, amphibians and reptiles.

There is the opportunity to improve this through a combination of works within and adjacent to the watercourse. In-channel measures include two stage channels, re-shaped river banks and vegetation management. Works adjacent to the watercourse include removal of the Environment Agency weir at the eastern end of the scheme, inclusion of more ponds, reed beds, wetland planting, wet woodlands and management of the existing woodlands, meadows and marshes.

The removal of invasive species will help improve habitat conditions and some areas will continue to have restricted public access to maximise the ecological potential of the Hoe Valley.



### Enhance the pedestrian and cycle network

There is potential for the Hoe Valley to become a more efficient sustainable transport corridor by enhancing the existing pedestrian and cycling network to improve connectivity, especially in terms of continuous access along the Hoe Stream corridor from Smart's and Prey Heath to Woking Town Centre and Old Woking.

It is vital that footpaths / cycle way are accessible for wheelchair users and pushchairs throughout the year, ensuring the whole community is able to benefit from the water environment.

Footpaths will link with existing urban areas along the length of the scheme to provide direct, safe and attractive routes between local communities and other green infrastructure sites (current and proposed) across the area. Works to the transport network will be considered holistically with the ecological enhancements proposed.



### Water quality and flow

The water quality data collected for the Hoe Stream shows it requires improvement. The project is a chance to achieve this through improving the flow of the river and controlling pollutants entering the watercourse.

A number of sections of the river are too wide, often caused by erosion, which is preventing adequate water flow, with slow moving sections showing significant siltation and stagnation, reducing both the quality of the water and the ecological habitat. There is the potential to reduce the width of certain sections of the watercourse, to improve the flow and therefore the quality of the water environment in these areas.

In addition to water flow challenges, there are a number of locations where foul water and surface water outfalls from the Thames sewer network are discharged into the watercourse. These flows can contain harmful pollutants that can cause significant harm to the water environment. The inclusion of attenuation ponds, wetlands and reed beds within the project can all serve as an effective way of treating filtering pollutants before they are discharged back into the watercourse.



### Improve educational awareness

The Council wants to create and enhance opportunities for people, schools and community groups to learn about the environment, the threats it faces and benefits of a diverse and integrated river environment.

There are a number of educational establishments within 1.5km of the Hoe Stream and the project has potential to provide a number of features to facilitate outdoor learning adjacent to the watercourse. These could include dipping platforms, information boards, outdoor classrooms, nature watching huts and interactive trails alongside the river, wetlands and ponds.

Educational features will aim to be interactive wherever possible to engage all ages and can also be tailored to suit adult users, providing information of the habitats and species that can be found within the Hoe Valley and provide information on why certain features have been incorporated into the Scheme and the benefit they provide for the natural environment.



### Provide community recreation

In addition to improving the walking, cycling and nature based experiences, a number of spaces along the Hoe Stream should allow for greater use by the local community.

These spaces will need to be sensitively designed and located to not adversely affect the ecological enhancements proposed but can include picnic and seating areas, meadows and lawns, the inclusion of some children's informal natural play and fitness trails.



# THE HOE STREAM RESTORATION PROJECT: HAVE YOUR SAY

## OLD WOKING - EXISTING SITE



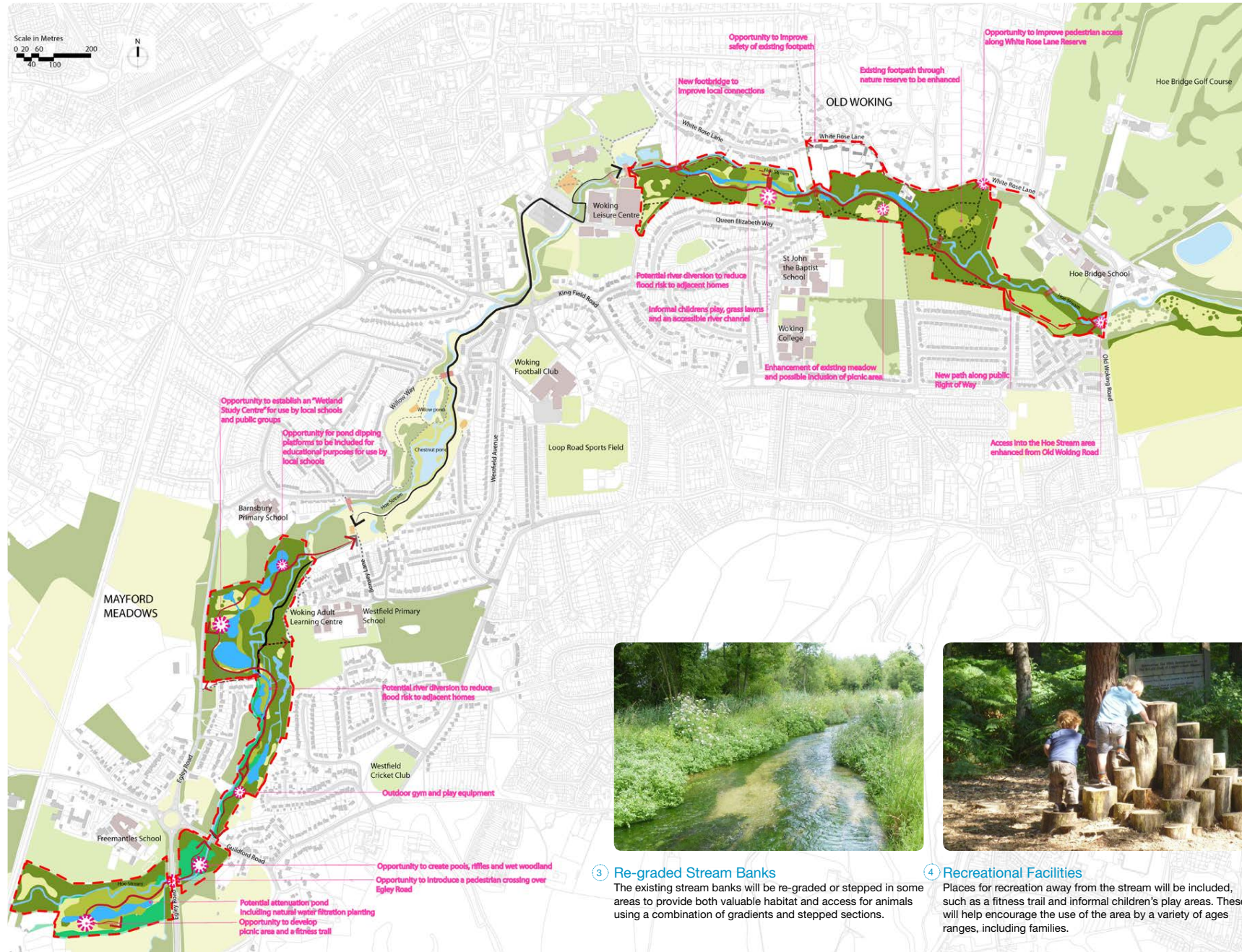
## MAYFORD MEADOWS - EXISTING SITE





# THE HOE STREAM RESTORATION PROJECT: HAVE YOUR SAY

## SITE STUDY AREA



### 1 Improved Water Quality

Enhancements will be introduced to improve the flow and scour the stream bed, removing areas of siltation and improving the ecological habitat. Natural features such as boulders and riprap to create riffles, scrapes and pools should be used where possible.



### 2 Vegetation Management

Vegetation throughout the project area will be reviewed to ensure the river is able to breathe. The reduction of Himalayan Balsam will be investigated alongside retention of mature trees which provide shade for fish, perches for Kingfishers and foraging habitat for bats.



### 3 Re-graded Stream Banks

The existing stream banks will be re-graded or stepped in some areas to provide both valuable habitat and access for animals using a combination of gradients and stepped sections.



### 4 Recreational Facilities

Places for recreation away from the stream will be included, such as a fitness trail and informal children's play areas. These will help encourage the use of the area by a variety of ages ranges, including families.



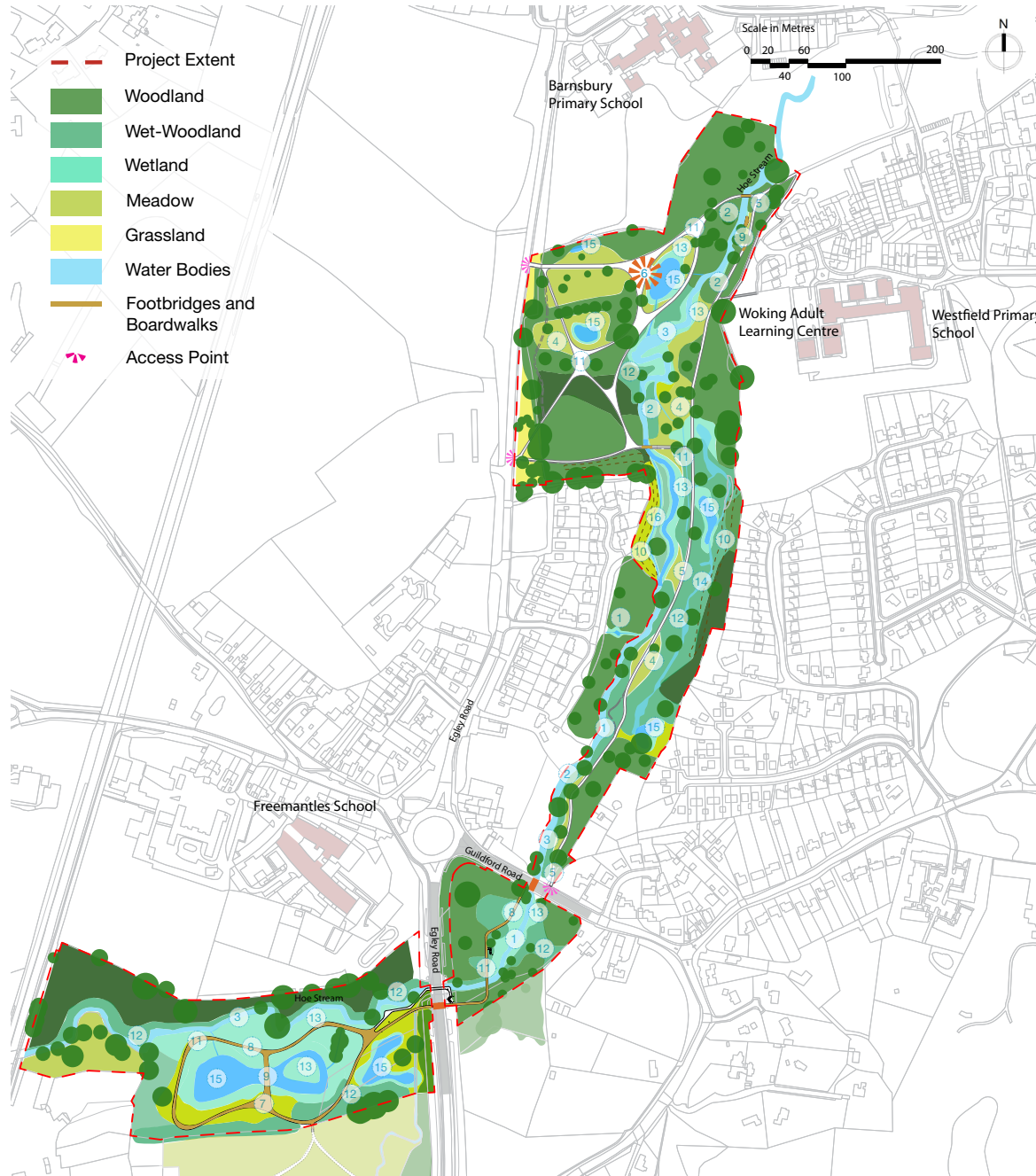
### 5 A Continuous Footpath & Cycle Network

A continuous footpath and cycle way from Prey Heath SSSI to Old Woking will be integrated through the area. New routes will complement existing paths but will allow safer access all year round and provide improved connectivity from surrounding communities.



# THE HOE STREAM RESTORATION PROJECT: HAVE YOUR SAY

## MAYFORD MEADOWS - STRATEGIC ENHANCEMENTS



**6 Wetland Study Centre**  
A new educational facility located adjacent to the watercourse will provide a safe learning environment for local schools and groups. The scale, materiality and overall appearance of the building will be appropriate to its location within Mayford Meadows.



**7 Nature Watching Huts**  
Sheltered facilities where members of the public can observe the wildlife without causing disturbance. The nature watching huts could also include information boards on the wildlife that is supported by the local area.



**8 Boardwalks**  
In some areas where the ground is prone to retaining moisture, boardwalks will maintain an accessible footpath throughout. This will use recycled plastic where possible and be accessible for wheelchair users and pushchairs.



**9 Dipping Platforms**  
Dipping platforms adjacent to ponds, wetlands and smaller ditches can be incorporated into the scheme at carefully considered locations to enable visitors to get closer to the water environment.



**10 Bunds**  
The use of bunds / embankments will be carefully located throughout the project area to help protect adjacent properties from flooding.



**11 Information Points**  
Wayfinding elements along the length of the river will improve public understanding of the habitats and species that can be found within the Hoe Valley and why certain features have been incorporated into the project.



# THE HOE STREAM RESTORATION PROJECT: HAVE YOUR SAY

## OLD WOKING - STRATEGIC ENHANCEMENTS



- - - Project Extent
- Woodland
- Wet-Woodland
- Wetland
- Meadow
- Grassland
- Water bodies
- Footbridges and Boardwalks
- ▶ Access Point



- 17 Cascade / Fish Pass**  
The two weirs along Hoe Stream currently serve as barriers to upstream and downstream fish migration. Removal of the weir or the inclusion of fish bypass channel and the implementation of a cascade feature would remove these major barriers, and introduce a more natural gradual change to the gradient of the stream bed. This would give the stream a much more natural appearance and will also make it easier for fish to migrate upstream and downstream.

### SOME PROPOSED ELEMENTS...



- 12 Wet Woodland**  
Wet woodland habitats will be created in areas of low-lying land which regularly flood providing habitat for insects, bats, otters and birds.



- 13 Wetlands**  
Wetlands shall be retained in some areas and introduced in others to provide habitat for wetland plants, amphibians, nesting birds, water voles and otters. The wetlands shall also be designed to provide attenuation for surface water flows, serving as an extension of the floodplain and reducing downstream flood risk.



- 14 Channel Management**  
The stream channel could be managed through the incorporation of two-stage and braided channels, to help improve water flows in low-flow conditions, provide flood alleviation storage, and potentially afford suitable habitat for water voles.



- 15 Attenuation Basins & Ponds**  
Ponds can be introduced to help attenuate and treat surface runoff, but also to help diversify and enhance ecology with reed beds around the pond edges.



- 16 Backwaters**  
Branching off the main Hoe Stream, backwaters will provide a seasonal pool habitat and aid management of the watercourse.