

## FLOOD RISK MANAGEMENT

### Executive Summary

This report provides an update in relation to the Flood Risk Management work undertaken by the Council. It provides further information in relation to the Flood Risk Management Projects, the background to each project, the stage of each project and the next steps to progress each project.

The Flood Risk Management Projects are innovative, integrated, multi-beneficial enhancement schemes that provide flood risk, environmental and social benefits to residents and the local community. Each project is being developed with partners to achieve the best possible outcome.

To help improve flood resilience and resistance in the Borough Flood Risk Management activities can take many forms not only in relation to large flood alleviation projects, but also smaller interventions within areas such as rain gardens, maintenance, education and planning. The Council is looking at all options to help reduce the flood risk to Borough residents and communities.

The recommendations below reflect the current priorities and the ability to deliver schemes in future years.

### Recommendations

The Executive is requested to:

#### RESOLVE That

- (i) the current flood risk management work and the summary of future works be noted;
- (ii) the release of £400,000 be agreed during the financial year 2020/2021 to the Environment Agency as part of the Council's partnership contribution from the Investment Programme to allow the environmental enhancements and health and wellbeing aspects of the Byfleet Flood Alleviation Scheme to be investigated, designed and incorporated into the final scheme; and
- (iii) the release of £100,000 from the Investment Programme to allow the investigation, design and construction of further raingardens within the financial year 2020/2021; and a further £100,000 per year for the following 4 years as per the Investment Programme, be agreed.

### Reasons for Decision

Reason: To improve the Borough's resilience and resistance to future flooding.

The Executive has the authority to determine the recommendation(s) set out above.

## Flood Risk Management

**Background Papers:** None.

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### 1.0 Introduction

- 1.1 Since 2013 the Borough has been affected by flooding multiple times both from the River Wey and from intense thunder storms. Since these events, multiple works have been undertaken and progressed to help relieve flooding in the local areas.
- 1.2 Due to historic flooding in the Borough the Drainage and Flood Risk Team has been working on numerous projects and work streams to help improve resilience and resistance to flooding to our communities and our residents.
- 1.3 Flood risk management takes many forms from education to planning, to large flood alleviation schemes and retrofitting small scale innovative interventions such as raingardens.
- 1.4 Working with partners and stakeholders for the benefit of our communities and residents many schemes are being developed and implemented to help improve flood risk to the Borough and ensuring flood risk is not increased in the future.
- 1.5 The schemes take an integrated approach not only looking at the benefit to our communities in relation to flood risk but also how they can improve biodiversity, air quality, water quality, access, health and wellbeing.
- 1.6 To allow some of the schemes to progress further it is now necessary for further funding to be released.

### 2.0 Work Programme

*Table 1: Work program for Flood resilience and resistance works*

Works/Scheme	Funding Required		Schedule						
	Project Costs £000	Potential WBC contribution £000	19/20	20/21	21/22	22/23	23/24	24/25	25/26
<b>Planning consultations</b>	n/a	n/a	Ongoing						
<b>Ordinary Watercourses/Ditch Maintenance</b>	n/a	n/a	Ongoing						
<b>Sutton Green FAS</b>	£200	£0	To be completed April 2020						
<b>Rain Gardens</b>	£500	£500	At least 6 raingardens in Rive Catchment completed by April 2022 subject to funding.						
<b>Byfleet FAS</b>	£12,600	£5400	Outline Business Case completed 20/21	Detailed design completed by April 22		Construction to commence 22/23			

<b>Hoe Stream River Restoration</b>	£10,200	£10,200	Model completed November 2019	Outline options Winter 2020, external bids to follow.	Detail 2023	design	Construction to commence 23/24 subject to funding	
<b>Old Woking FAS</b>	£10,000	£10,000	Initial assessment to commence 2020	to Autumn	Outline 2022	Options	Detail 2024	Design

### 3.0 Raingardens Project

- 3.1 Raingardens are specially designed natural storage areas that are able to take rain runoff from impermeable areas, treat and store it, releasing the filtered water slowly back into the surface water network at a controlled rate. The raingardens are being designed to take highway runoff that currently flows uncontrolled into the surface water network via highway gullies. They are being retrofitted into existing highway verges and roundabouts where proposed.
- 3.2 The project takes the catchment approach and holds water where it falls helping to improve the capacity further down the network. As there is no restriction in relation to the water entering the storage area, it takes the water off the road quickly in higher rainfall events which would otherwise flood the road as road gullies are only designed for a 1 in 5 year storm. Due to the special soil and planting the metals, carbon, hydrocarbons and other contaminants that would eventually flow into our rivers are naturally broken down. The silts and sediments are filtered out through the soil and stone construction layers helping to improve the water quality that effects our river ways.

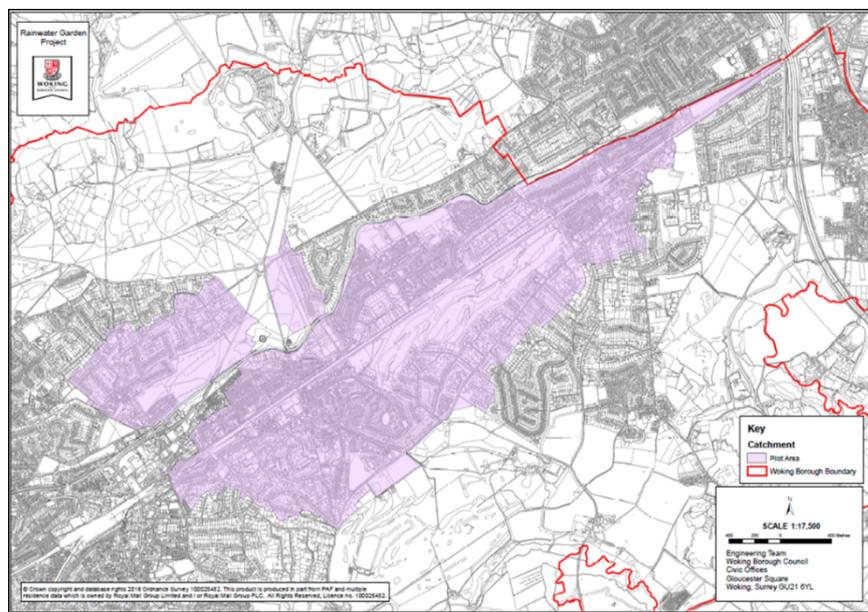


Figure 1: Rive catchment Rain Garden pilot area

- 3.3 The EAs surface water flood risk maps, Thames Water surface water maps and local flood knowledge has been used to identify potential sites within the Rive Catchment that could be suitable for Raingardens. The first raingarden has now been constructed in Blackdown Close and is fully established, it has been monitored over the last year.



*Photo 1: Blackdown Close Raingarden (before and after)*

- 3.4 Other raingardens are being currently being designed in 6 other locations within the pilot area, with the ambition that three further schemes will be constructed in the financial year 2020/2021 depending on funding.
- 3.5 Therefore, to allow further gardens to be designed and implemented in 20/21 we are requesting that £100,000 is agreed to be released to the project. To continue the programme in subsequent years we are also requesting the release of £100,000 each following years up to the value of £500,000 as shown in the Investment Programme.

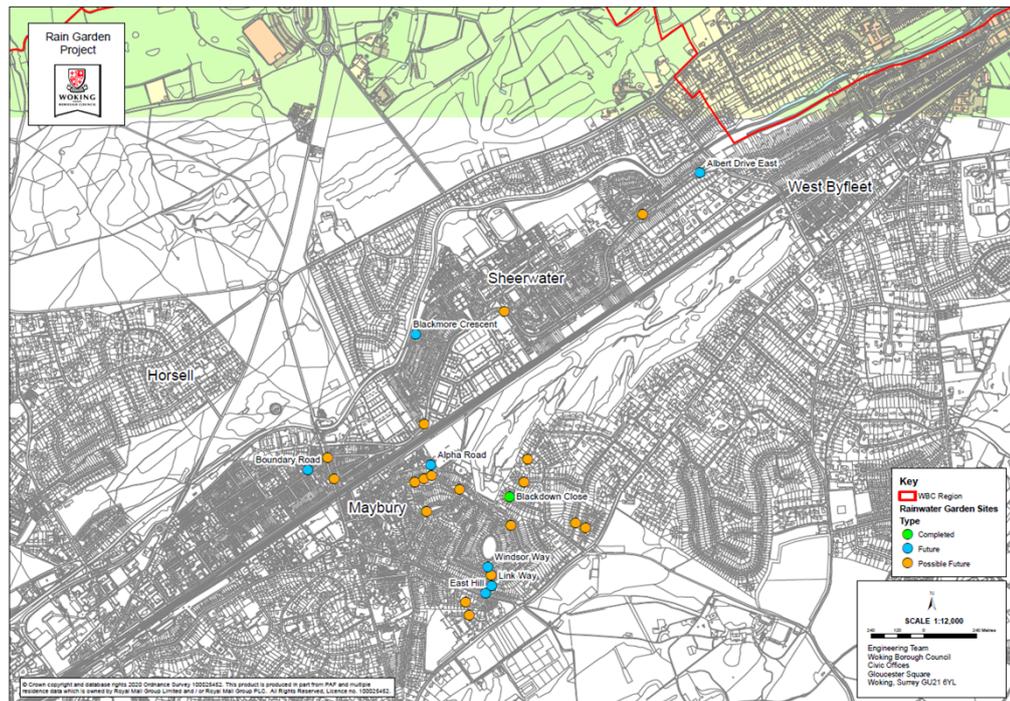


Figure 2: Location plan of future rain garden sites.

3.6 Following monitoring of the raingardens and their performance and maintenance requirements over the next couple of years, it is our ambition that these can be rolled out elsewhere in the Borough, as a further measure to increase general resilience from flooding.

#### 4.0 Byfleet Flood Alleviation Scheme (FAS)

4.1 Byfleet Flood Alleviation Scheme is being led by the Environment Agency (EA) and is a partnership between the EA, Surrey County Council (SCC), Woking Borough Council (WBC) and other local councils. This proposal will deliver joint benefits to the community and project partners.

4.2 Byfleet has been impacted by flooding numerous times with the most recent being February 2020 where one property has flooded internally and multiple other properties have been surrounded by water externally. The previous flood of Winter 2013/14 saw over 20 properties internally flooded in the Byfleet area. The largest flood to affect the area was in 1968 which was estimated to be a 1 in 200 (0.5%) Annual Exceedance Probability Event.



Sanway Road, 1968. This was one of the largest floods in this area and was estimated being a 1 in 200 year event.

- 4.3 As part of the flood alleviation scheme and other flood alleviation schemes along the River Wey, the existing river model has been updated to take into account the revised hydrology of the River Wey and the updated climate change allowances. This modelling has now been completed and has been used to inform the potential flood alleviation options being taken forward.
- 4.4 The vision for the Byfleet scheme is that it can be a multi beneficial scheme that can achieve more than simply looking at reducing flood risk in the area. Therefore we are looking at the scheme to:
- ❖ Improve habitat connectivity with other wetland areas along the River Wey corridor, including the Hoe Stream and sites
  - ❖ Restore and create a mosaic of wetland habitats that allow wildlife to thrive, including ephemeral and permanently wet features, such as scrapes, ditches, ponds and backwaters
  - ❖ Restore relic river channels and Improve lateral connectivity with the floodplain
  - ❖ Improve fish passage for all fish species around three weirs and contribute to the wider Wey FWD project which is aiming to open up over 100km of river to fish
  - ❖ Restore and create highly naturalistic, flow-dependent habitat that supports a wide variety of wildlife
  - ❖ Create new habitats for species, such as otters, water voles, bats and birds
  - ❖ Improve water quality by tackling point source and diffuse pollution issues
  - ❖ Connect people with their local environment and heritage and create opportunities for nature/river based recreation and learning
  - ❖ Improve connectivity to existing public access points through sensitive integration of a network of footpaths and cycleways
  - ❖ Incorporate vistas and landscaping to provide an engaging viewing spectacle for visitors using the site without impacting detrimentally on any of the existing or proposed ecological value
- 4.5 The proposed scheme is to provide protection in the Sanway area of Byfleet through a combination of flood embankments and flood wall as well as multiple environmental enhancements within the River Wey and the Broad Ditch. The scheme proposed would provide a 1 in 100 (1%) annual probability plus climate change Standard of Protection (SoP).

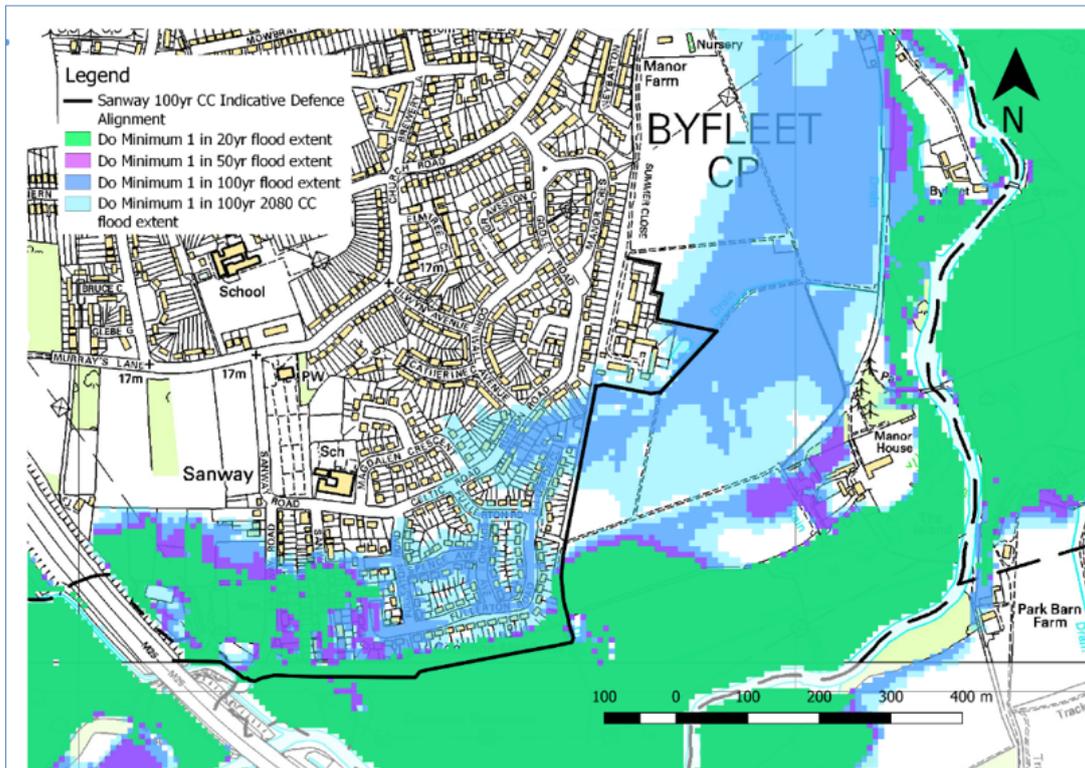


Figure 3: Flood Extents in Byfleet without defences

- 4.6 The EA are currently preparing an outline business case for the scheme which is expected in 2020. With detail design being completed in 2022 and construction beginning 2022/2023. The estimated total cost for the scheme is approximately £10 million.
- 4.7 To allow the design and incorporation of the environmental and wellbeing elements of the scheme into the final project the EA require the £400,000 contribution from WBC in 2020/21 financial year as set out in the Investment Programme.
- 4.8 The current program for the works is for the Outline Business case to be completed Winter 2020/2021, Detail Design April 2022, Construction Spring/Summer 2022 and completion Spring/Summer 2023. The Environment Agency are hoping to arrange the next public consultation in Spring/Summer 2020.

Map showing proposed Sanway flood alleviation scheme (FAS) boundary and associated environmental opportunity search area, centred on 506,374, 159,991, created 22/10/19

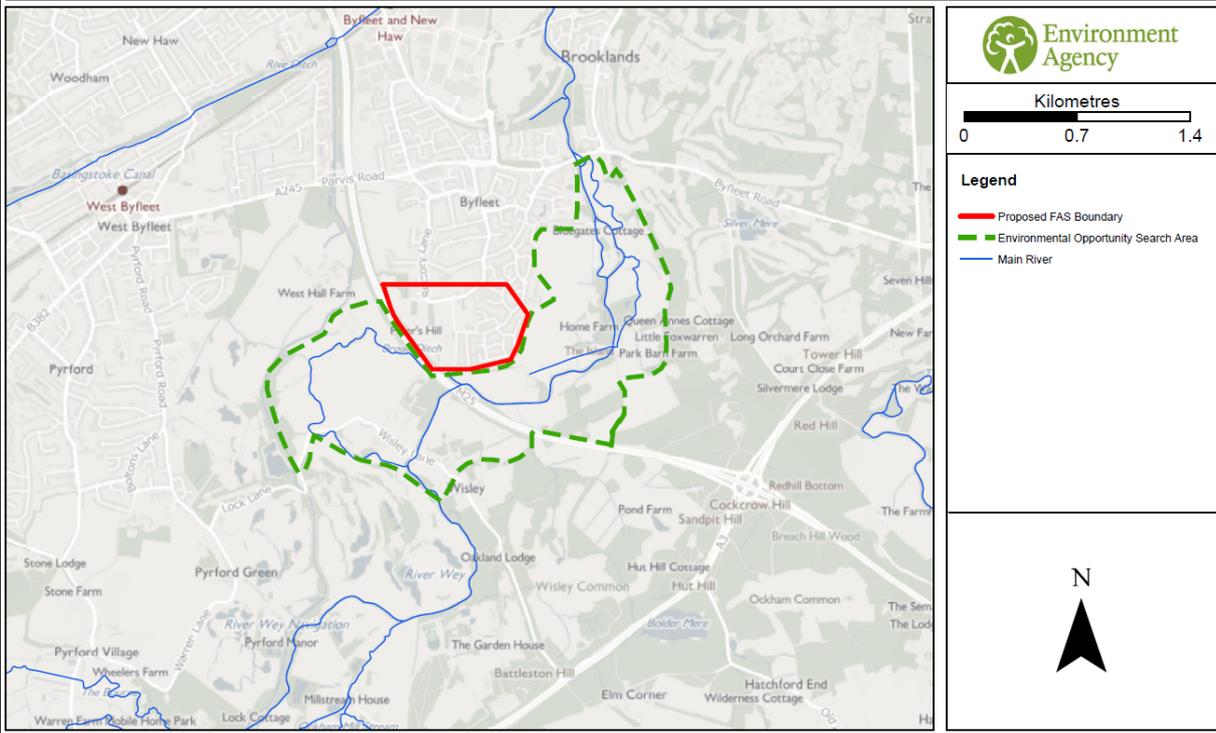


Figure 4: Proposed FAS Boundary and Environmental Improvements Area

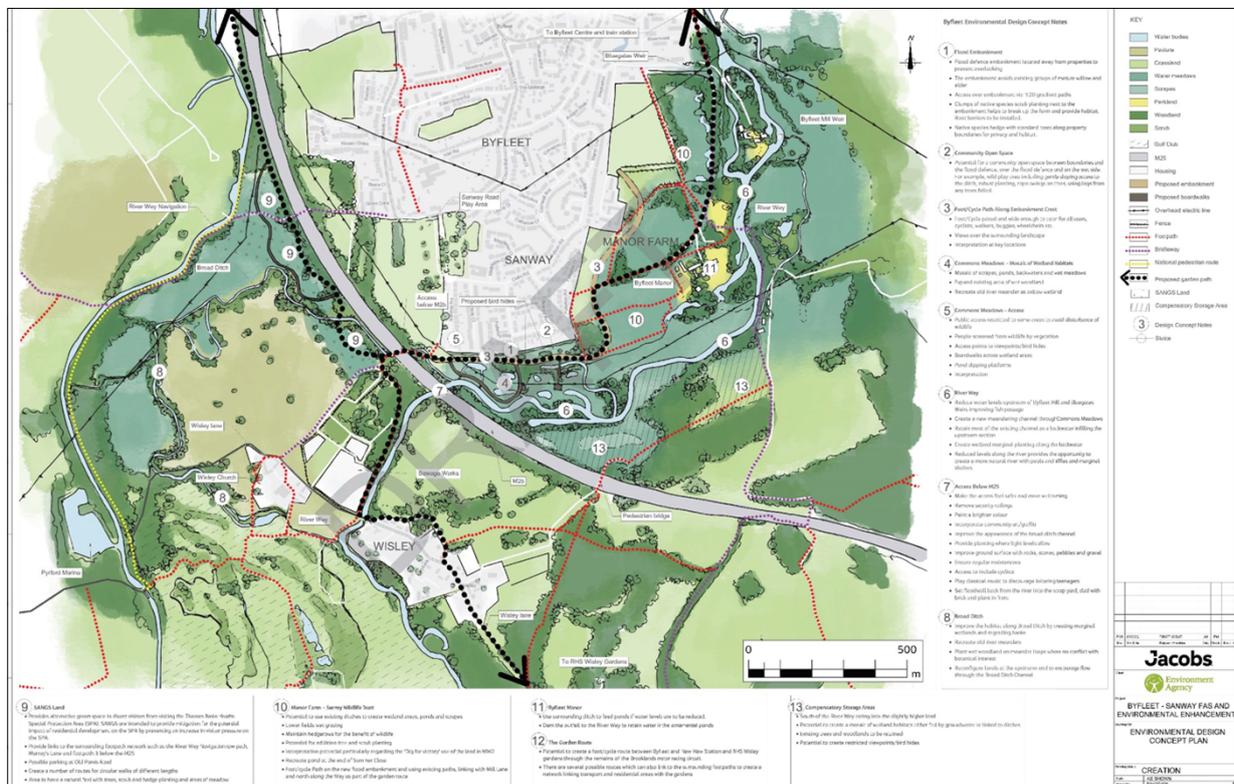


Figure 5: Concept plan of Environmental Improvements

### 5.0 Hoe Stream Restoration Project

- 5.1 The Hoe Stream Restoration Project is a multi-beneficial ambitious scheme that adopts an environmental led approach to retaining and enhancing a natural landscape of historical significance close to Woking Town Centre. It intends to restore 42 ha of the Hoe Valley with 6km of river improvements, 6ha of wetland creation and over 1ha of new woodland. The restoration aims to reveal and preserve the site's heritage for future generations by enhancing opportunities for visitors, schools and community groups to learn about the environment whilst improving accessibility for all and reducing flood risk to nearby homes. There is also an emphasis on improving the health and wellbeing of the local community by providing alternative transport methods and improving air and water quality. We are working with the Environment Agency, Surrey Wildlife Trust and other partners in the development of the scheme to ensure the Hoe Valley is better managed and maintains excellence for years to come.
- 5.2 As part of the overall scheme design it has been necessary to remodel the Hoe Stream in relation to the flood risk as both the climate change allowances and the hydrology since the original model was completed has been revised.
- 5.3 When considering the risk of flooding to areas, it is common practice to also assess the risk of climate change on the area. In relation to Rivers this value was set at an increase of 20% on the 1% annual probability river flows. This increase was in accordance with UK Climate Predictions 2002 (UKCP02) research. Due to improvements in understanding and technology this research was updated in 2009 through the UK Climate Change projections project (UKCP09).
- 5.4 For the Thames area, in which Woking Borough is located, there are 3 climate change allowances. The 3 allowances are the central, high central and upper end.
- 5.5 As Woking Borough lays within the Thames Basin area the allowances (2070 to 2115) are:
- The Central Allowance – 25% increase
- The Higher Central Allowance – 35% increase; and
- Upper End Allowance – 70% increase
- 5.6 Although the approach is complicated, the main point to note is all these allowances are greater than the current allowance we use, this means the 1% annual probability plus the revised climate change extent may increase in the area, impacting additional residents in the future. However, this means we can incorporate the additional allowances into our project helping to investigate options to increase the flood resilience of the area.
- 5.7 The new allowances have formed part of the modelling required as part of the Hoe Valley River Restoration Scheme and will allow us to assess the impact of the new allowances in the Hoe Valley area and adjust the Flood Alleviation Scheme accordingly to reduce this future risk.
- 5.8 In addition to the updated climate change allowances the hydrology for the Hoe Stream has also been updated due to the improved understanding of the River since the 2013/2014 floods this has also been taking into account with the updated model.
- 5.9 The model has now been completed and has been signed off by the Environment Agency. Since then the project team has been assessing some of the proposed options within the scheme.

- 5.10 Unfortunately the project was unsuccessful in our external funding bid to the national lottery. Following receipt of the updated modelling we are now looking at different options for the proposed scheme including looking at a phased approach of option allowing us to apply for smaller funding pots, for specific phases, when they become available.
- 5.11 The project has developed concepts for the layout of the footpaths and walks through the entire site as well as design concepts for the proposed wetland centre. Due to the changes with the river model the current strategies, concept and alignments may need to change to ensure flood flows through the scheme are not impacted.

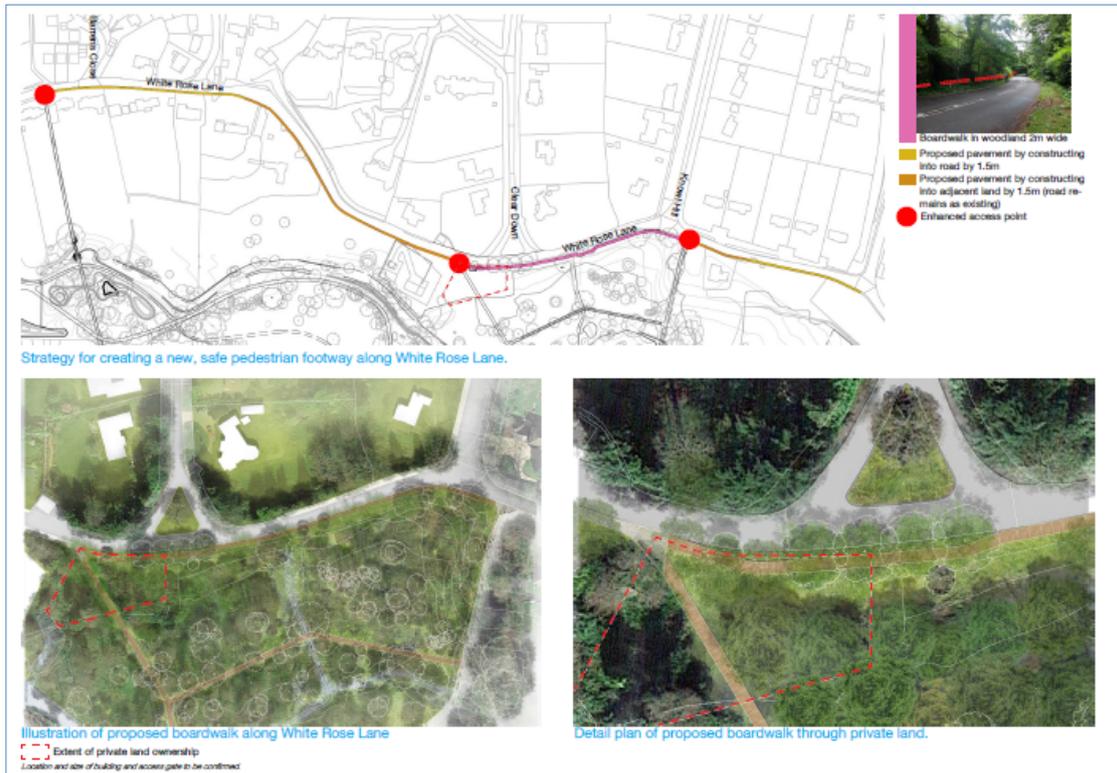


Figure 6: Concept of proposed footways along White Rose Lane and Within Local Nature Reserve

- 5.12 Education provides an important role in helping to ensure our waterways and the environment are maintained and improved in the future. To provide a safe and secure environment to help communities learn about waterways and their importance part of the scheme was to provide the facilities to achieve this.



*Figure 7: Artist Impression of Potential Wetland Center*

5.13 The approximate cost of the scheme is £10 million, including future maintenance allowances.

### **6.0 Old Woking FAS**

6.1 The Old Woking Flood Alleviation and Enhancement Scheme ambition is to be a multi-beneficial integrated environmental scheme; it takes an integrated approach to reducing flood risk, improving accessibility for all, establishing a diverse ecosystem, improves water quality and increases recreation in the area for the benefit of the local community and all residents which reside within the Borough.

6.2 The scheme has not progressed as far as the other schemes due to the work being undertaken on the other flood risk management projects and we have been waiting for the revised River Wey model data from the Environment Agency to help inform any potential designs and necessary works.

6.3 The estimated cost for the scheme is £10million with initial options being investigated from 2020/2021.

### **7.0 Implications**

#### Financial

7.1 The larger flood alleviation and restoration schemes have been shown in the Investment Programmes as per the table below.

## Flood Risk Management

Table 2: Extract from Councils Investment Programme

DETAILS OF PROJECT	20/21	21/22	22/23
	£000	£000	£000
River Wey Flood Prevention - Byfleet (funded by borrowing/reserves/grant)	400	400	9,800
River Wey Flood Prevention - Old Woking (funded by borrowing/reserves/grant)	500	9,500	
Hoe Valley Flood Alleviation and Enhancement Scheme (funded by borrowing/reserves/grant)	5,169	5,000	
Rainwater Gardens Project (Funded by Borrowing)	377		

Table 3: Revised Phasing for Flood Alleviation Projects

DETAILS OF PROJECT	20/21	21/22	22/23
	£000	£000	£000
River Wey Flood Prevention - Byfleet (funded by borrowing/reserves/grant)	400	400	5,000
River Wey Flood Prevention - Old Woking (funded by borrowing/reserves/grant)	-	500	9,500
Hoe Valley Flood Alleviation and Enhancement Scheme (funded by borrowing/reserves/grant)	650	4,519	5,000
Rainwater Gardens Project (Funded by Borrowing)	100	100	100

7.2 Opportunities for grants are being investigated in relation to the Raingarden project to help deliver further raingardens as well as looking at potential partnership contributions.

7.3 Opportunities for grants and partnership contributions are being investigated in relation to the larger flood alleviation projects to help deliver the future schemes.

### Human Resource/Training and Development

7.4 The above projects are being prioritised based on resources and officer time.

### Community Safety

7.5 The flood risk management work undertaken by the Council will help improve community safety in the Borough by improve flood resilience and resistance in the areas affected.

### Risk Management

7.6 A number of measures are being investigated to reduce the risk and improve resilience generally.

7.7 External funding for schemes may not be successful due to the competitive nature of bids, however officers are working to make sure bid applications are as competitive as possible.

7.8 The risks associated with not taking these projects further is that due to the impact of climate change the flood risk to residents will increase in the future within the Borough. The Schemes will serve as a positive public relations activity for the Council, benefiting both the Council's reputation with those living, working and visiting the Borough.

### Sustainability

7.9 There are no new sustainability issues raised by this report.

### Equalities

7.10 There are no new equality issues raised by this report.

### Safeguarding

7.11 There are no new Safeguarding issues raised by this report.

## **8.0 Consultations**

8.1 There are no consultations as part of this report.

REPORT ENDS