

## **River Ver and Verulamium Park Lakes Improvement Project**

### **Reach 1**

#### **Upper section of Verulamium Park including lakes**

**(NGR TL1383607447 - TL1413706840)**

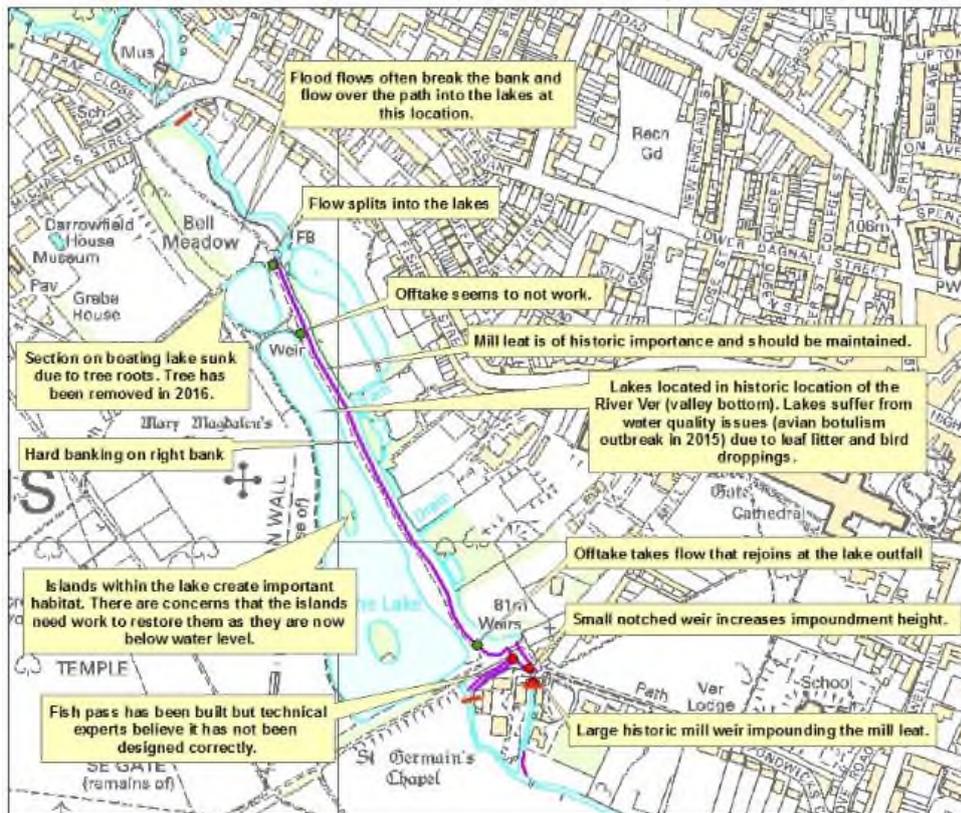
The River Ver flows through the upper part of Verulamium Park from Bell Meadow to the Old Fighting Cocks pub and to the outflow of the lakes. A main feature of this reach are the two linked ornamental lakes to the south west of the river. There are residential properties and a hotel to the north east of the river

#### **Reach 1 Issues**

- The river flow is split between the mill leat and the lakes at the upstream end of the reach. At the downstream end of the reach the water flows through another offtake and rejoins the River Ver at the lake outfall. The channel bifurcates into the fish pass channel and the old mill channel.
- The lake suffers from water quality issues which are believed to be due to the shallow nature of the lake, leaf litter accumulating in the lake, wild fowl populations and inappropriate feeding habits of park visitors. This has resulted in suspected avian botulism outbreak and algal blooms.
- The mill leat is impounded and higher than the natural valley bottom. It is over wide with hard banking on the right bank. As such, the habitat within the mill leat is very poor with silt dominated bed and homogenous flows.
- Technical experts believe the fish pass does not work effectively.

Figure 3 highlights these issues on an annotated map.

**Figure 3**, Reach 1 issues annotated map



## River Ver Restoration Reach 1 issues

Protective Marking Classification  
Not protectively marked

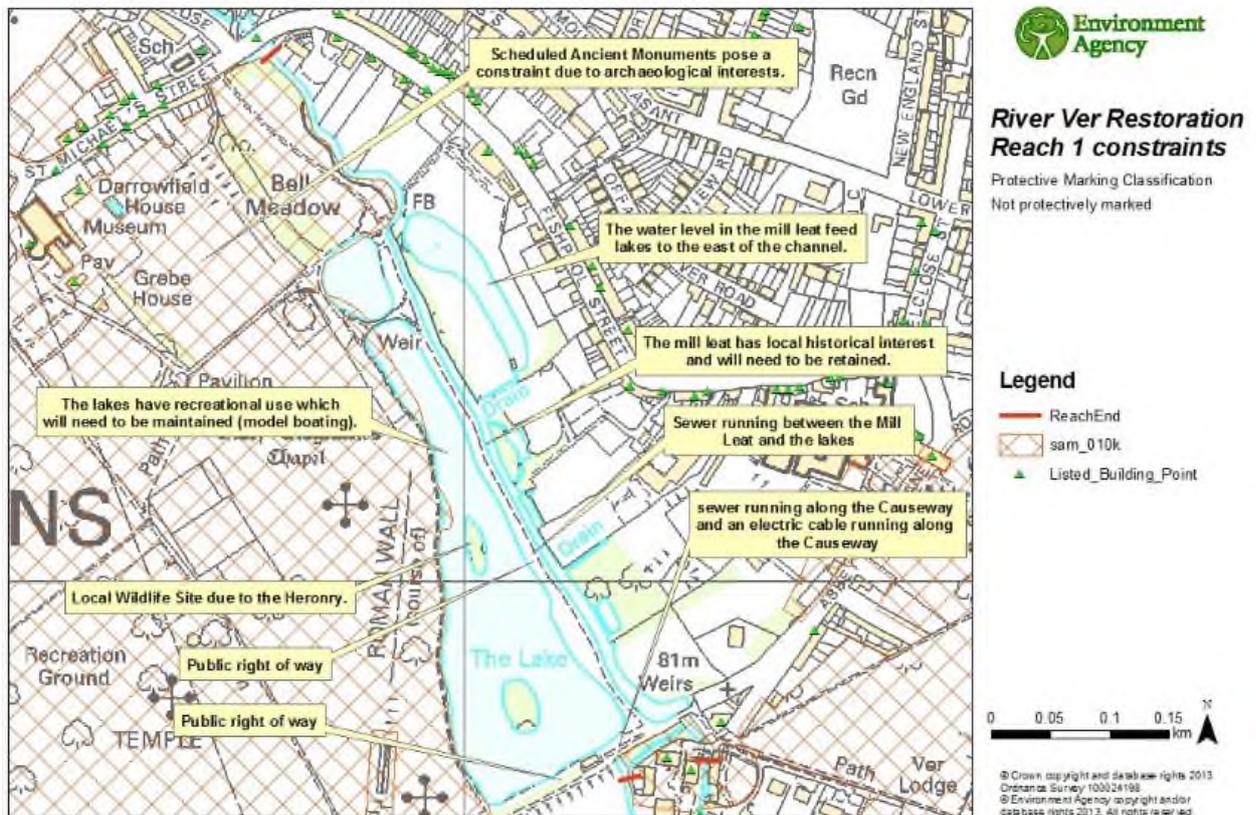
### Legend

- ReachEnd
- Weir
- Pumping\_Station
- Offtake
- Hard Bank
- Embankment

### Reach 1 Constraints

- The Scheduled Ancient Monuments.
- The mill leat has local historical interest and may need to be retained in some form.
- The water level in the mill leat feeds online lakes to the north east of the channel.
- Planning restrictions as the site falls within a conservation area.
- The structural condition of the concrete in the lakes is not known.
- Recreational uses of upper lake may need to be maintained for instance model boating.
- The islands on the lakes are a Local Wildlife Site due to the Heronry.
- Services may pose a constraint to the option development (e.g. sewer running between the Mill Leat and the lakes, sewer running along the Causeway and an electric cable running along the causeway).
- Flood risk – there is both potential for increased risk and opportunities for the scheme to deliver a reduction in flood risk.
- Both the causeway and the eastern bank hold Public Rights Of Way, St Albans City 030 & 034.
- The river runs adjacent to properties

Figure 4, Reach 1 constraints annotated map



### Reach 1 Objectives

- Identify sustainable, feasible options to manage the water quality and improve the habitat of the lakes (including the islands).
- Identify feasible options to improve the habitat and natural functioning of the river through the site. This will help improve the river ecology and move towards meeting the Water Framework Directive objectives.
- Ensure the Council's and park users' aspirations for the park are incorporated into the design where possible.

## Reach 2

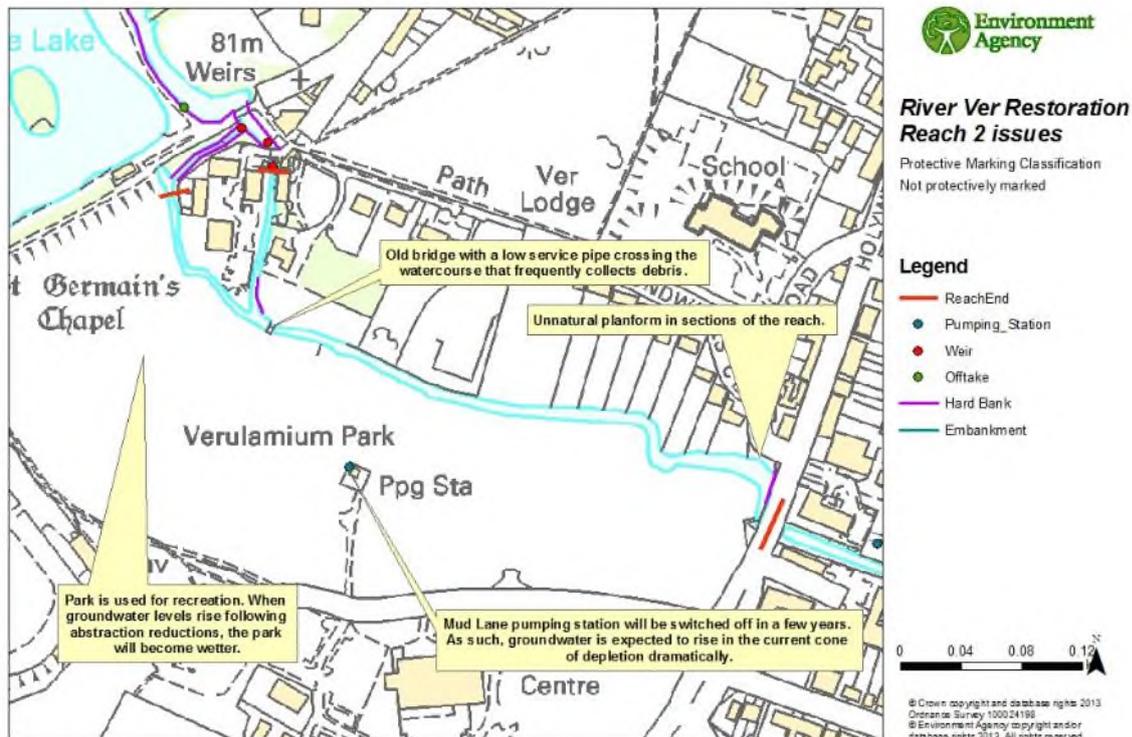
### Downstream section of Verulamium Park to Holywell Hill road (NGR TL1413706840 - TL1453306612)

There is open parkland to the south of the River Ver and residential properties to the north. The river here is more natural and meandering in form.

#### Reach 2 Issues

- The channel is not in the natural valley bottom.
- Some of the channel is too heavily shaded
- An old bridge with a low service pipe crosses the watercourse and collects debris.
- Mud Lane pumping station is located in this reach and Holywell pumping station is located just downstream. Abstraction at these pumping stations is planned to be reduced in the near future.

Figure 5, Reach 2 issues annotated map

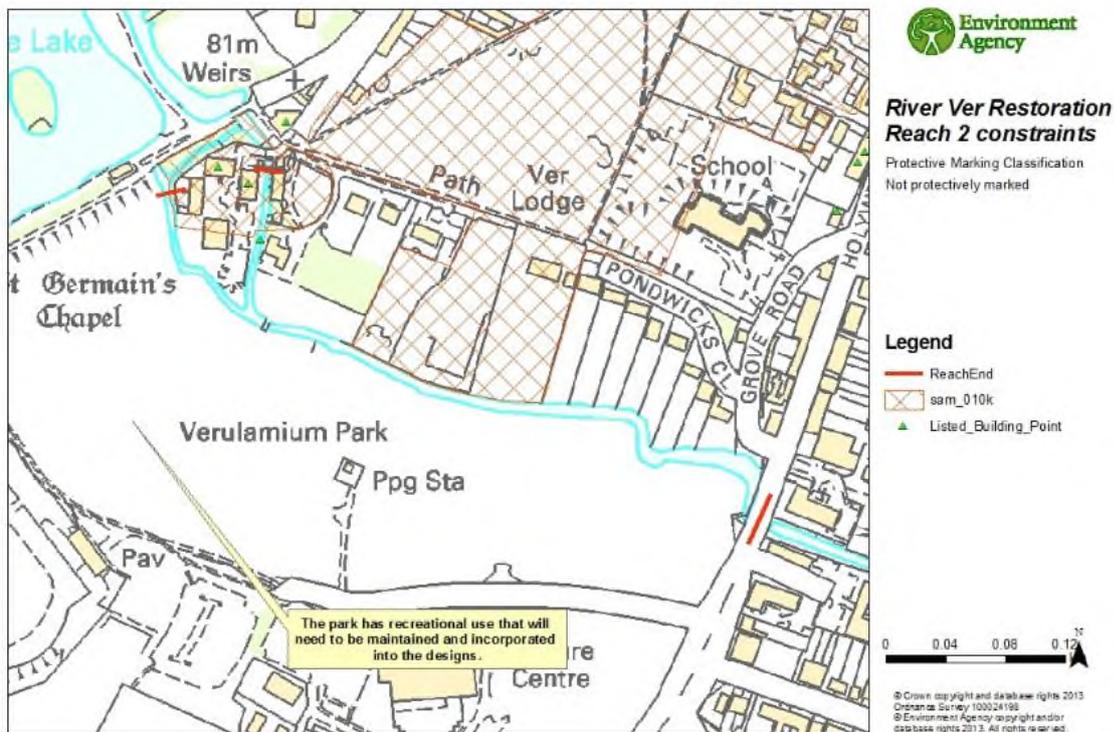


#### Reach 2 Constraints

- Scheduled Ancient Monuments.
- Planning restrictions as the site falls within a conservation area.

- The park's current and future recreational use must not be impacted negatively, this is currently the main events space within the park.
- Services may pose a constraint to the option development.
- Flood risk – there is both potential for increased risk and opportunities for the scheme to deliver a reduction in flood risk.
- Trees and scrub along the river provide a screen for properties to the north.
- The river runs adjacent to a number of properties

**Figure 6, Reach 2 constraints annotated map**



### Reach 2 Objectives

- Identify feasible options to enhance the habitat and natural functioning of the river through the site. This will help improve the river ecology and move towards meeting the Water Framework Directive objectives.
- Understand the changes to groundwater levels in the park following the pumping station reductions.
- Identify opportunities for wetland habitat creation and improved recreational use.

## Reach 3

### From Holywell Hill to Cottonmill Lane Allotments

(NGR TL1453306612 - TL1477106515)

The River Ver flows under Holywell Hill road then follows a straight channel backing onto properties to the south and open space to the north.

#### Reach 3 Issues

- The river is in a very straight channel and is lacking in habitat diversity. It is also heavily shaded for most of this reach.
- Holywell pumping station is located in this reach and Mud Lane pumping station is just upstream. Abstraction at these pumping stations is planned to be reduced in the near future.

Figure 7, Reach 3 issues annotated map



#### Reach 3 Constraints

- Services may pose a constraint to the option development.
- The river runs adjacent to a number of properties

#### Reach 3 Objectives

- Identify the feasibility of options to enhance the habitat and natural functioning of the river through the site. This will help improve the river ecology and move towards meeting the Water Framework Directive objectives.

## Reach 4

### Cottonmill Lane Allotments

(NGR TL1477106515 - TL1498006558)

The River Ver flows around the northern edge of Cottonmill Lane Allotments before crossing under Cottonmill Lane. To the north of the river is a footpath, open space and the Sub Aqua Club.

### Reach 4 Issues

- The river channel is not in the natural valley bottom.
- Channel habitat is poor as a result of over shading and lack of bed gradient.
- Hard bank engineering is present along some of the channel.
- There is a small weir at the downstream end of the reach near the road bridge.
- The allotment site floods frequently and for extended periods of time. It is believed that the flooding is a combination of fluvial, groundwater and possibly surface water drainage / historic drainage. The allotments are at a lower level than the river and the timing of flooding does not always coincide with high groundwater or rainfall events. For further information please see figure 8.
- This reach is just downstream of Holywell and Mud Lane pumping stations. Reduction in abstraction is planned in the near future and groundwater levels are expected to rise within the current cone of depression. Given that the allotments have flooded in the past when pumping has been reduced, flooding here is likely to increase.

**Figure 8**, Rainfall, groundwater and discharge data comparison to Allotment flooding periods

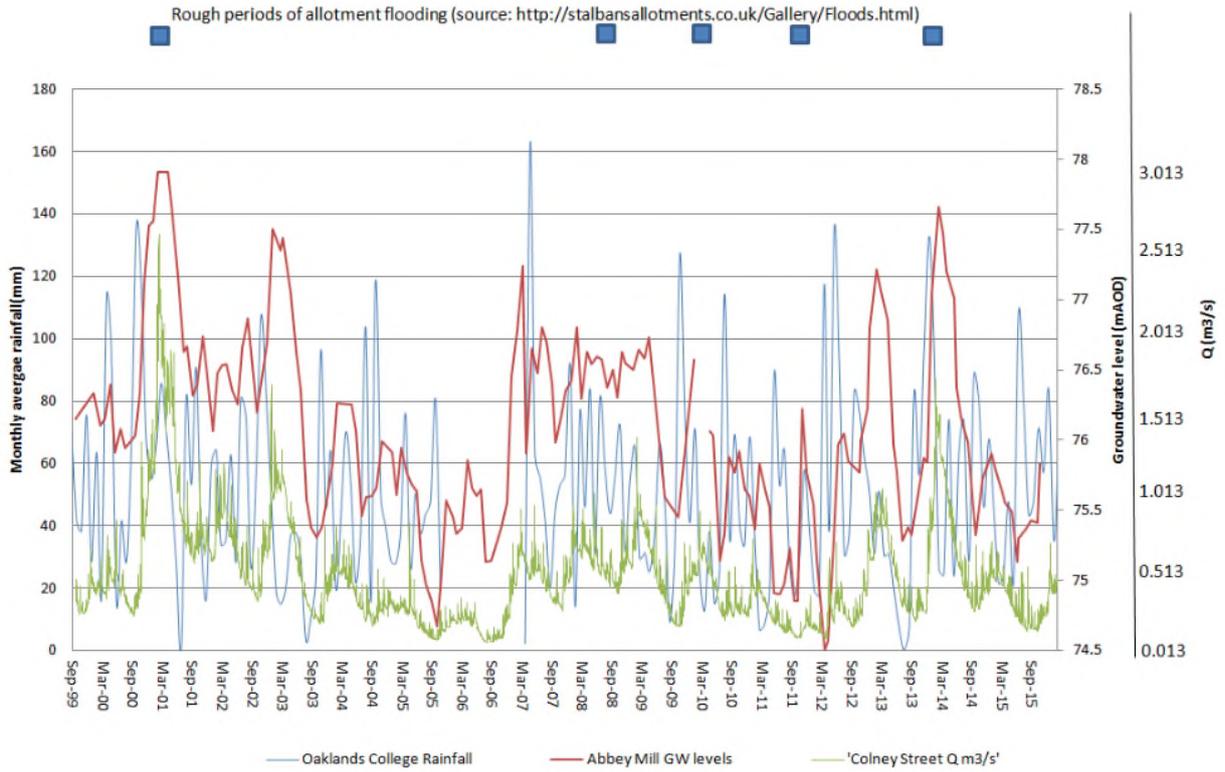


Figure 9, Reach 4 issues annotated map



#### **Reach 4 Constraints**

- Statutory allotment site.
- Services may pose a constraint to the option development.
- Footpath
- Flood risk – there is both potential for increased risk and opportunities for the scheme to deliver a reduction in flood risk.

#### **Reach 4 Objectives**

- Identify the feasibility of options to enhance the habitat and natural functioning of the river through the site. This will help improve the river ecology and move towards meeting the Water Framework Directive objectives.
- Identify solutions to allotment flooding. Relocation of allotment plots needs to be considered and alternative potential allotment sites will need to be identified with the aim to have no net loss of allotments and a gain if possible.

## Reach 5

From Cottonmill Lane to just upstream of Watercress Wildlife Site.

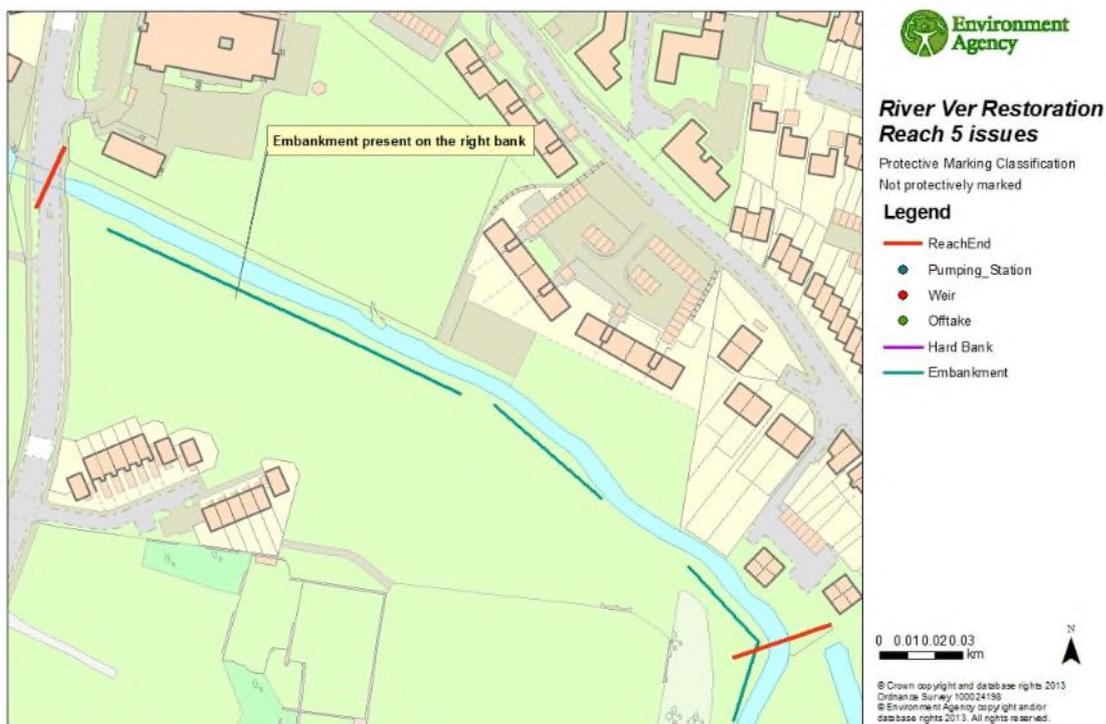
(NGR TL1498006558 - TL1524506390)

There is open parkland and Sopwell Nunnery to the south of the river and a school and residential properties to the north. Although the river is raised above the valley bottom and is not in its natural location, it has naturalised well and has some good habitat variability.

### Reach 5 Issues

- There is an embankment on the right bank that could be removed or set back to allow better floodplain connectivity, however care will need to be taken not to disturb the nesting kingfishers.
- The river is not in the bottom of the valley and therefore probably not connected to the groundwater. An area to the south of the channel becomes wet during some winters. Holywell and Mud Lane pumping stations are upstream of this reach and abstraction at these is due to be reduced in the near future. This area and others through this reach may see groundwater emergence as a result of this.

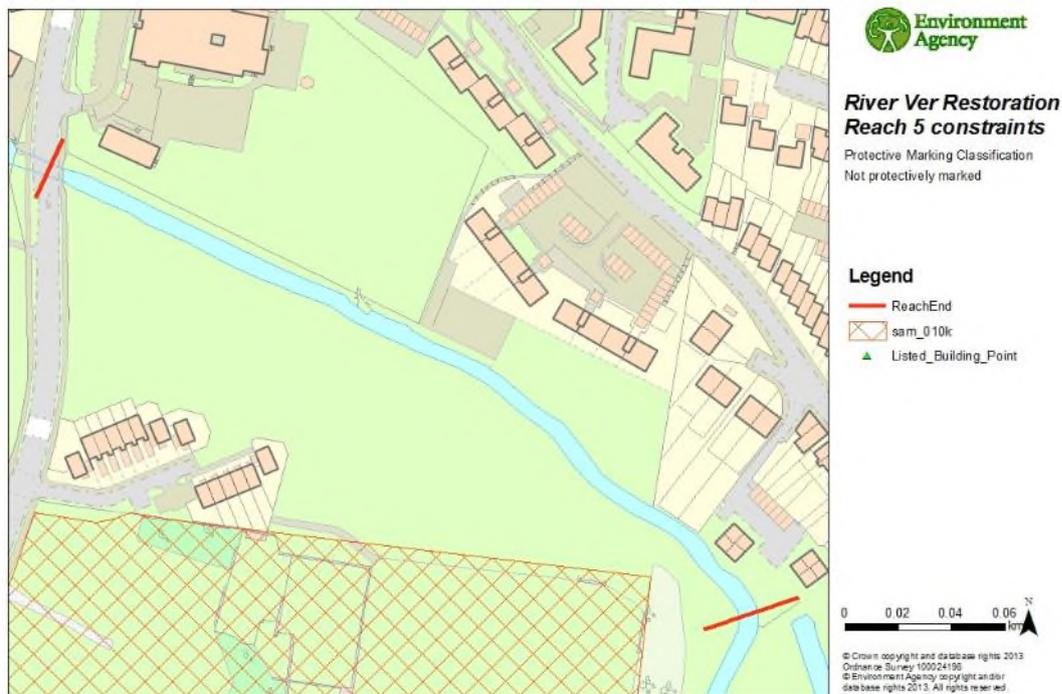
Figure 10, Reach 5 issues annotated map



## Reach 5 Constraints

- Scheduled Ancient Monuments.
- Services may pose a constraint to the option development.
- Flood risk – there is both potential for increased risk and opportunities for the scheme to deliver a reduction in flood risk.
- Potential for groundwater emergence from reductions in abstraction at Mud Lane and Holywell Hill pumping stations.
- Kingfishers nest in the river bank here.

Figure 11, Reach 5 constraints annotated map



## Reach 5 Objectives

- Consider the effect of Holywell and Mud Lane pumping station reductions
- Identify feasible options to improve the habitat and natural functioning of the river through the site. This will help improve the river ecology and move towards meeting the Water Framework Directive objectives.

## Reach 6

### From Watercress Wildlife Site to Sopwell Mill Farm

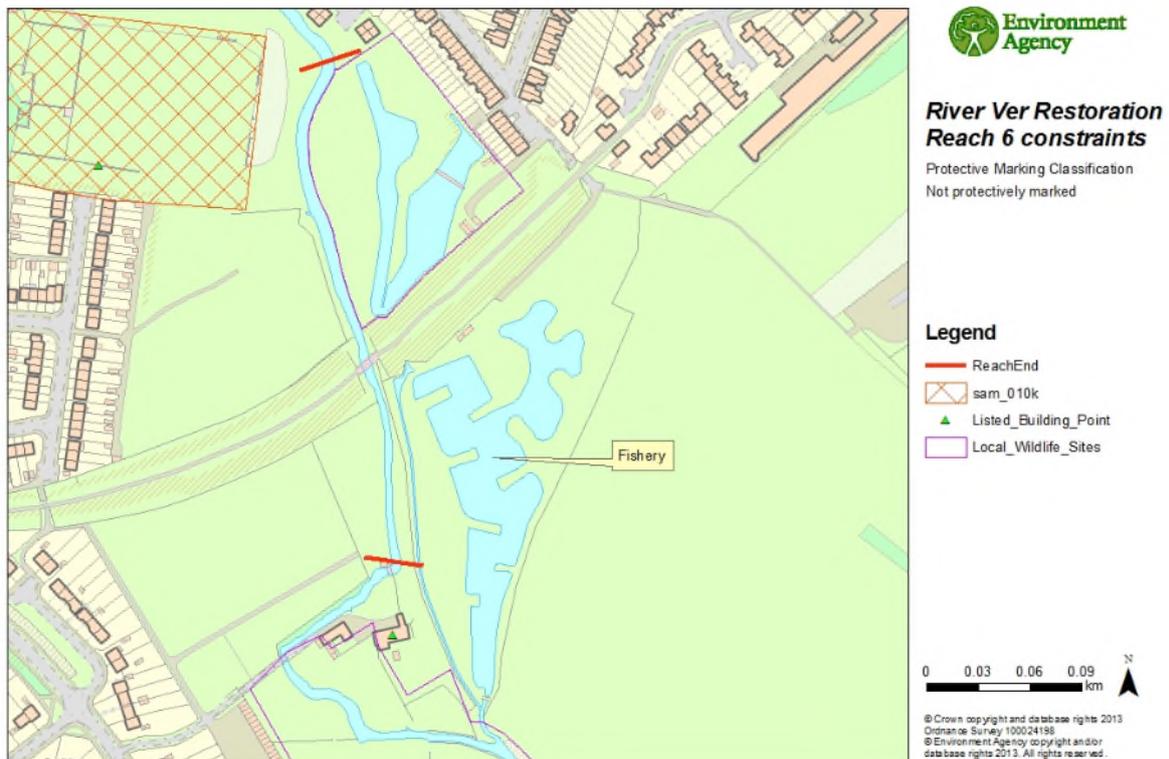
(NGR TL1524506390 - TL1528406094)

To the north of the Alban Way, there is a wildlife site to the east of the river and allotments to the west of the river. To the south of the Alban Way, there are fishing lakes to the east and open parkland to the west.

### Reach 6 Issues

- The flow is split between the river and the Watercress Wildlife Site and fishing lake. There is little understanding of the nature of the flow split.
- There are raised embankments present on top of the right bank of the river.
- The path is on the edge of the steep right bank of the river and is eroding in several places due to its close proximity and exacerbated by dogs accessing the river.
- Downstream of Alban Way the channel has been dredged in the past.
- Recent works to allow more light into the river have made some improvements to the channel habitat downstream of the Alban Way.

Figure 12, Reach 6 issues annotated map



### **Reach 6 Constraints**

- Services may pose a constraint to the option development.
- Flood risk – there is both potential for increased risk and opportunities for the scheme to deliver a reduction in flood risk.
- Local Wildlife Site/Local Nature Reserve.
- Footpath must be retained.
- Allotments.

### **Reach 6 Objectives**

- Identify the feasibility of options to enhance the habitat and natural functioning of the river through the site. This will help improve the river ecology and move towards meeting the Water Framework Directive objectives.
- Understand the flow split and design options to optimise the flow split for the river, Local Wildlife Site and fishery.
- Identify options to stabilise the footpath and improve the steep right bank of the river