

## Kirkley Stream Flood Report - October 2015

### 1. Background

In December 2013, almost 200 homes and business were flooded in Lowestoft as a result of a tidal surge. This prompted the start of a Lowestoft-wide project to deliver ways to reduce the risks from all forms of flooding. The Lowestoft Flood Risk Management Project (LFRMP) is jointly led by Suffolk County and Waveney District Councils in partnership with the Environment Agency, Anglian Water, Associated British Ports and other key partners. The project has identified some £25 million funding to deliver flood risk management measures – with completion of this complex and wide-ranging project expected by 2020/1.

It is clearly recognised that whilst tidal flooding is the biggest threat to the town, there are areas at risk from river and surface water flooding also. Recently completed computer modelling identified a number of locations along the Kirkley Stream as at risk of river and surface water flooding in Lowestoft. Maps 1a and 1b shows areas at risk of river and surface water flooding along the Stream. This data can also be view on [www.gov.uk/prepare-for-a-flood](http://www.gov.uk/prepare-for-a-flood) .

As a result the project is identifying options that would reduce the risks, as well as assessing costs and technical feasibility. Other areas across the town are being studied. Public consultation on the project strategy and the options proposed will take place December 2015/January 2016.

Heavy rainfall on 24 July 2015 clearly demonstrated the modelled risks for the lower part of the Kirkley Stream, sadly resulting in over thirty homes being flooded. As a result of this, Suffolk County Council was required, (under Section 19 of the Flood & Water Management Act), to undertake an investigation into this specific event. A Section 19 report is carried out where more than five adjacent properties are flooded internally (as defined in the Suffolk Local Flood Risk Management Strategy – see [www.greensuffolk.org/flooding](http://www.greensuffolk.org/flooding)) and thus only applies to the Aldwyck Way/Velda Close area. A draft version of the Section 19 report is appended. Once this report is finalised the Recommend Actions can be taken forward by the relevant responsible authority, the majority of which will fall within the wider Lowestoft Flood Risk Management Project.

This paper provides more detail than the draft Section 19 Report and covers the whole of the Kirkley Stream (or Brook as it is sometimes known) from Carlton Colville to its outfall into Lake Lothing at Kirkley Ham.

### 2. Flooding in July 2015



On the night of 24/25 July 2015, 82mm rainfall fell – the equivalent of twice the July average rainfall. This amount of rainfall is regarded as having a 2.5% chance of happening in any one year (also described as a 1 in 40 year event) so is unusual. This heavy rainfall appeared to overwhelm the stream and local drainage systems resulting in flooding of 33 homes in Aldwyck Way and Velda Close, affecting main living areas to a depth of some 300 - 500mm. Further reports of garages and gardens flooded were also received. About 50m of public highway in this locality was flooded to an approximate depth of 450mm.

In Carlton Colville there was a report of one home and numerous roads and gardens affected by flooding, including foul sewage. Roads were reportedly flooded to a depth of about 300mm. Maps 1a and 1b identify flooding incidents reported to Suffolk County Council and its partners at the time.

Subsequently we have learned of a number of historic flooding incidents, suggesting the whole area has had similar rainfall events in past years, and the presence of some form of flood protection measures and a warning alarm, fitted to a number of properties in Aldwyck Way, indicates that the area is prone to flooding from time to time. It is regrettable that these flood protection measures did not appear to function adequately on the night in July. Previously, a storm water attenuation tank had been fitted in the area to reduce flooding from the drainage systems. Climate change and increasing development is likely to increase the risk of more frequent flooding of this type in future.

As soon as flooding was reported Waveney District Council mobilised to assist flooded residents in the following days, including working closely with Cotman Housing Association to re-home residents and clean the streets. Anglian Water was on the scene early on 25 July to clear the stream of blockages caused by a build-up of debris (natural and fly-tipped material). Anglian Water and Suffolk County Council have since been checking and clearing their drainage systems in Carlton Colville to reduce further risks to the affected resident in Carlton Colville.

### **3. Why did the flooding occur and who's doing what?**

The volume of rainfall in a short period of time appeared to overwhelm the capacity of the drainage systems at certain locations – both Anglian Water's sewers and Suffolk County Council's highway drains. Soon after the flooding the highways teams checked its systems and found them to be functioning satisfactorily. Highways systems are cleansed every nine months – the previous time being in December 2014 (Aldwyck Way area) and January 2015 (Carlton Colville area). The area that drains into the Kirkley Stream is large and increasingly built up, with most surface and highway water eventually ending up in the stream. As development occurs the associated drainage systems have been designed to cope with certain levels of rainfall. Recent events suggest that these systems need to be re-examined in order to determine whether there is adequate capacity. When the stream filled with water the drainage systems were unable to fully discharge and water backed up the system overflowing into roads and gardens. Some drainage outfalls also seem to be close to the bed level of the stream and did not drain out satisfactorily. A survey is currently being undertaken to understand bed levels in the stream.

#### **3.1 Bloodmoor Roundabout to Lake Lothing (the area covered by the draft S19 report)**

The Kirkley Stream drains out into Lake Lothing. When the tide is in water is unable to drain out under gravity. Anglian Water has a pumping station at Kirkley Ham which is used to lift water into Lake Lothing. Anglian Water inspected this pump on the night of the flooding and confirmed it was working as it should be and well within its capacity.

The Stream was partly blocked in places by debris washed down and catching on grilles and areas of excessive vegetation. Coupled with the amount of water flowing into the stream, this caused water to overtop the banks and directly flood into the lower areas around, eventually getting into homes and gardens. Some of the debris was natural, but a significant amount of illegally dumped garden and fly-tipped waste contributed to the problem (see photo right). Since 2002 Anglian Water has been carrying out monthly maintenance visits to Kirkley Stream to ensure all key screens along the length of the stream were kept clear of debris. There were occasions when more extensive work was required to remove trees, garden waste and various other types of materials that were dumped into stream – as in this instance.





There is a flood storage area between the stream and Tom Crisp Way – shown on Map 2a. This was designed to be a natural feature and was planted up with reeds after construction to enhance the natural environment and not to need any regular maintenance. We have no evidence to suggest this feature failed to work as a storage area on the night of 25/26 July in spite of a partial blockage by vegetation of the six large pipes between the stream and this flood storage area (see photo left). The blockages have subsequently been cleared and the wider LFRMP will investigate whether increasing the capacity in this storage area could be a mechanism for further reducing flood risk.

*Piped inlet into the flood storage area (after clearance)*

The channel from Bloodmoor Roundabout to Kirkley Ham Park is the responsibility of Anglian Water and all the surrounding land belongs to Suffolk County Council. Together they are responsible for ensuring access to the stream for the purposes of inspection and for ensuring the channel is flowing freely. There is a need to review the access and inspection points.

There are a number of grilles/culverts along and draining into the stream (also shown on Maps 2a/b). Suffolk County Council Highways inspect its assets regularly for structural integrity and Anglian Water ensures that blockages along the channel are cleared. After the 24 July flooding Anglian Water and Suffolk County Council recognised that there was excessive vegetation in the area and, working together, cleared access routes into the stream and removed bulrushes and other growth from the channel bed.



*Area next to Aldwyck Way before (left) and after (right) channel clearance*

Currently a survey is being undertaken to inform the hydraulic model which will ascertain whether the bed is silted up to an extent that is increasing flood risk and whether additional vegetation clearance would further reduce flood risk. This is due for completion early November. The result will determine if works are required in which case they will be undertaken as quickly as possible within the constraints of funding, health and safety and UK ecological law – overseen by the LFRMP.

It is worth noting that the area between the Kirkley Stream and Tom Crisp Way was designed to be a 'green corridor' at the suggestion of residents and as a condition of the planning consent when the new road was put in. It was designed to be left natural. It is a valuable nature area rich in flora and fauna and the stream itself hosts several protected species. For this reason any vegetation management that is deemed necessary will need to be undertaken sensitively and at the right time of year. An ecological survey has already been completed to provide guidance on how to undertake such work.

Alongside Tom Crisp Way are three drainage basins/ponds, the responsibility of Suffolk County Council Highways – see Map 2a. These are solely for the collection of water draining off the road and were designed to incorporate some vegetation as another ecological feature. There is no evidence that water flowed out of these ponds during the 24/25 July event and they are not deemed to be a contributing factor to the flooding.

### 3.2 Carlton Colville area

The flooding in the Carlton Colville area was predominantly on the roads as a result of the highway drains being unable to discharge into the stream. Suffolk County Council highways has since cleared local gullies and jetted a culverted section of the Kirkley Stream from Bell Vue, The Street to No.73 The Street, to ensure the system is running freely. It has also agreed to postpone the installation of a zebra crossing nearby until the associated drainage issues have been fully considered.

As part of the wider LFRMP, it is recognised that this section of the stream requires some vegetation clearance and the Environment Agency had planned this work for late autumn 2015. The Partnership sent out a note to the Town Council in August detailing the works planned. Further investigations have suggested that beyond this routine clearance there may need to be some additional work to assist flows and enable drains to discharge more easily. This may involve the removal of a large tree in the channel. These suggestions are being considered for implementation as part of the LFRMP. The Environment Agency is responsible for this section of the Stream that is designated as ‘main river’ – see Map 2b. This means it has powers to undertake works and to enforce other riparian owners to do work deemed necessary to prevent flood risk. (For details of riparian owners’ responsibilities please see <https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities>). However, these are permissive powers and it takes a risk-based approach, so will not undertake works if the costs greatly outweigh public benefits.

### 4. Next steps and timetable

The draft Section 19 report makes a number of recommendations in relation to the area between Bloodmoor Roundabout and Kirkley Ham and included below are these (with added explanations) and recommendations for the Carlton Colville area.

1. Maintenance procedures and responsibilities for the whole of Kirkley Stream to be reviewed. Environment Agency, Anglian Water Suffolk County and Waveney District Council’s to discuss and report by end February 2016. This will include reviewing access arrangements for inspection and maintenance. Any short term requirements will be implemented as soon as possible, with other activities linked to the wider Lowestoft Flood Risk Management Project (LFRMP).
2. A full topographical survey of Kirkley Stream (bed and bank) in relation to property thresholds, highway attenuation areas, flood storage area etc is currently underway – due to be completed in November. This will help inform actions needed both in the short and longer term. We intend to provide more details by early next year.
3. Anglian Water and Suffolk County Council drainage system designs to be reviewed. Increasing the capacity of these systems is likely to be costly and alternative ways of making space for flood water - such as additional or large flood storage areas - may prove more suitable options. This will be considered as part of the LFRMP as a longer term action.
4. Anglian Water’s trash screen, which catches debris as it flows down the stream, may need to be redesigned and its suitability for a telemetry monitoring system assessed. This would give a warning when blockages are occurring allowing more rapid removal of debris, reducing the chances of flooding caused by blockages within the stream. Anglian Water will report on this early in 2016.

5. Flood resilience measures to be considered for all properties at significant flood risk. This will be a matter for the home owners and Housing Association to progress.
6. Flood volunteers to be trained and appointed to aid vulnerable residents in the event of future flooding emergencies. Suffolk Joint Emergency Planning Unit will support volunteer Community Emergency Planning (CEP) Groups and the development of their Community Emergency Plans'. The volunteers could also be trained to provide advice to residents about actions that may contribute towards flooding.
7. Consideration to be given to the creation of some means to limit any new discharges into the Kirkley Stream, thereby reducing the potential impacts of future development. Suffolk County Council, Waveney District Council (as planning authority), Anglian Water and the Environment Agency to consider this proposal and make recommendation to the Suffolk Flood Risk Management Partnership in spring 2016.

We do not currently have all the answers about what measures would help to reduce flood risk, or precise details about when anything required can be actioned. This report should thus be regarded as an interim update with an expectation that we will keep residents informed as progress is made. There will also be public consultation as the Lowestoft Flood Risk Management Project progresses so that affected residents and interested parties can shape longer-term options for flood risk management as they are taken forward.

Please let us have any further evidence you feel would assist us further by contacting any authority listed below.

### **Helpful contacts:**

**Anglian Water:** 03457 145 145 (24-hour, 7 days a week)

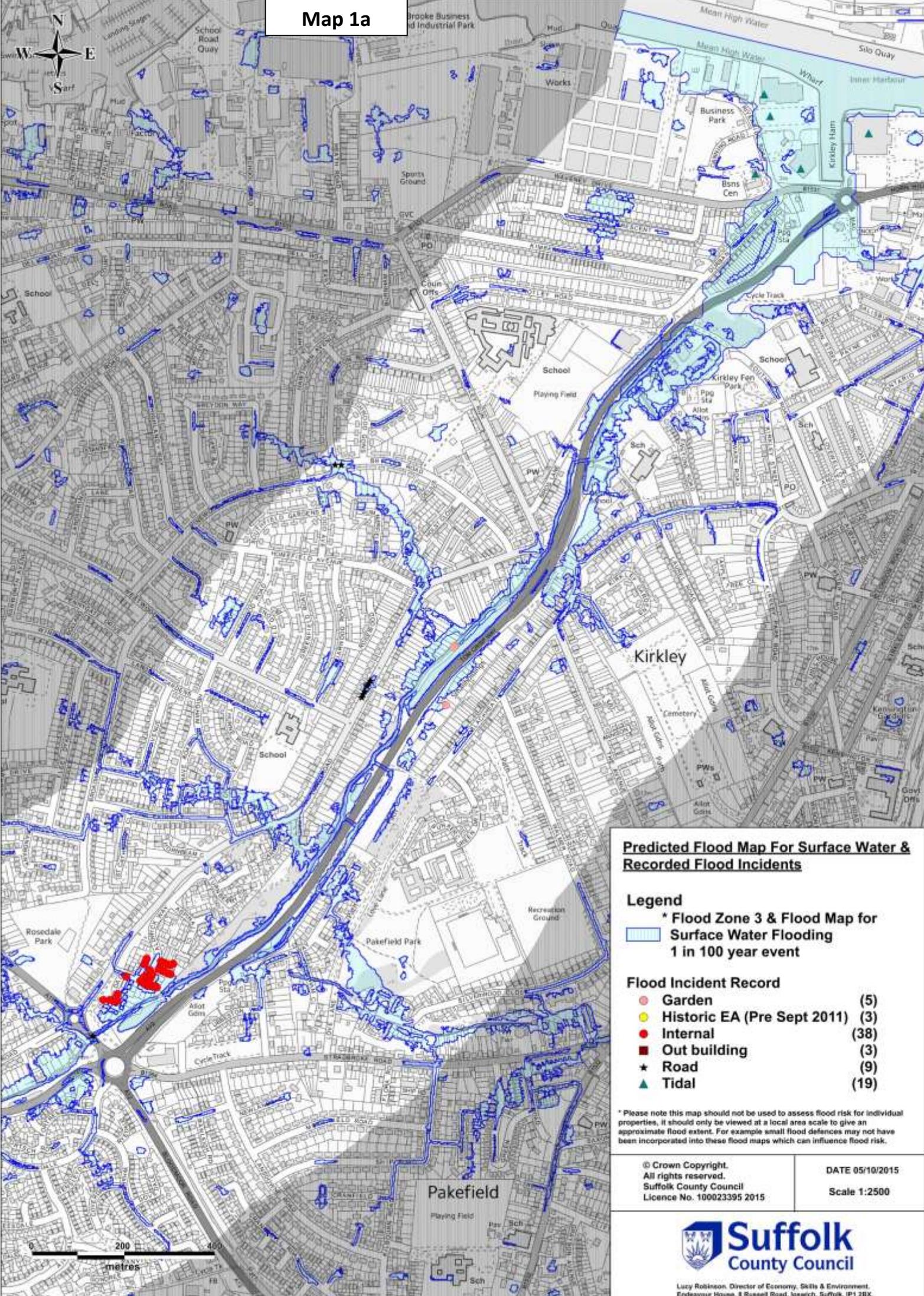
**Environment Agency Flood Line:** 0345 988 188 (24-hour)

**Suffolk County Council:** 0345 606 6171 (emergencies);  
0345 606 6067 (office hours)  
[floods@suffolk.org.uk](mailto:floods@suffolk.org.uk) or online reporting on [www.suffolk.gov.uk](http://www.suffolk.gov.uk)

**Waveney District Council:** 01502 527133 (emergencies); 01502  
562111 (office hours)

**Suffolk Joint Emergency Planning Unit:** 01502 523321 (office hours);  
contact via Waveney District Council in an emergency

Map 1a



**Predicted Flood Map For Surface Water & Recorded Flood Incidents**

**Legend**

\* Flood Zone 3 & Flood Map for Surface Water Flooding 1 in 100 year event

**Flood Incident Record**

- Garden (5)
- Historic EA (Pre Sept 2011) (3)
- Internal (38)
- Out building (3)
- ★ Road (9)
- ▲ Tidal (19)

\* Please note this map should not be used to assess flood risk for individual properties, it should only be viewed at a local area scale to give an approximate flood extent. For example small flood defences may not have been incorporated into these flood maps which can influence flood risk.

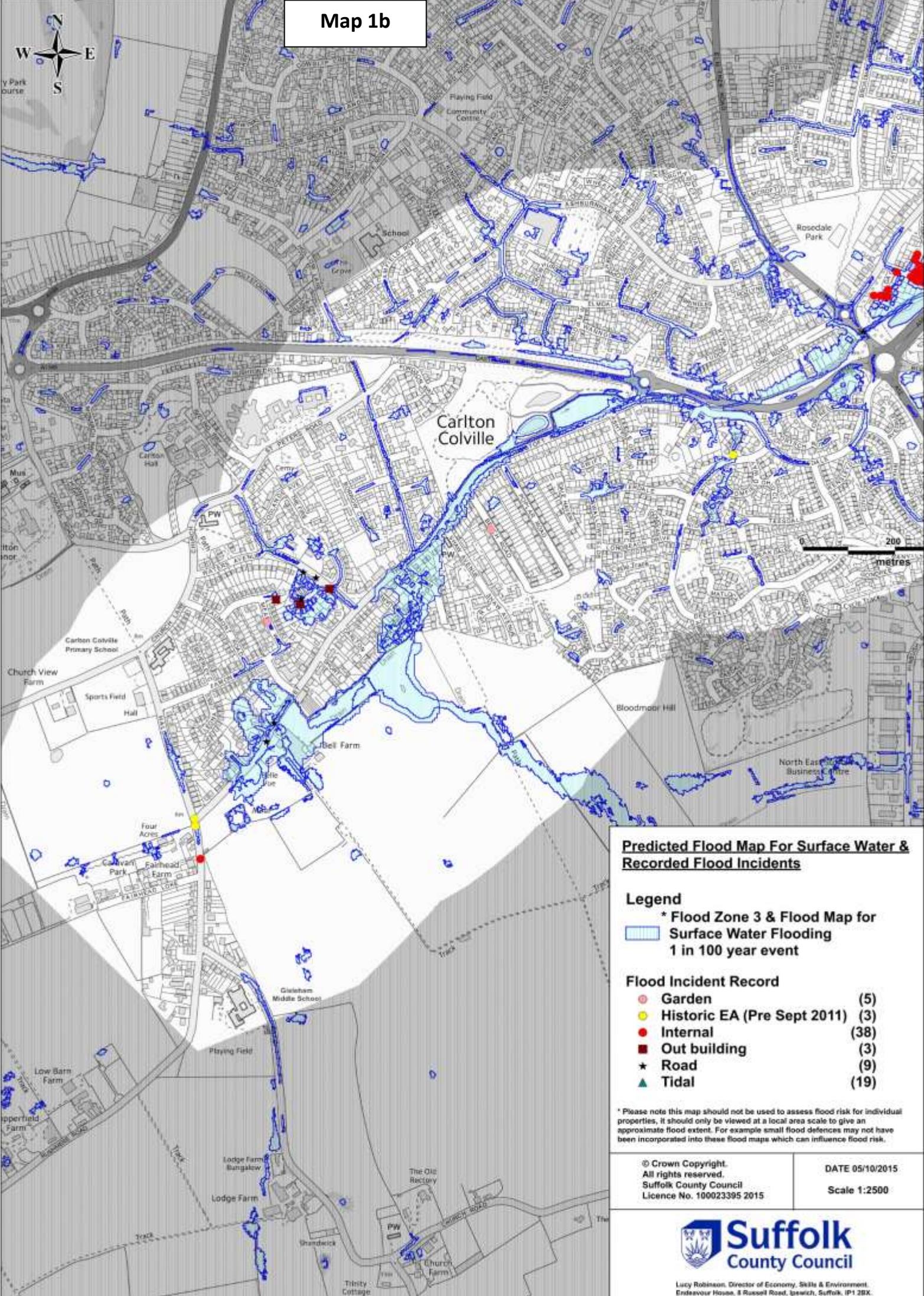
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Scale 1:2500



Lucy Robinson, Director of Economy, Skills & Environment,  
Endeavour House, 8 Russell Road, Ipswich, Suffolk, IP1 2BX.

Map 1b



**Predicted Flood Map For Surface Water & Recorded Flood Incidents**

**Legend**

- \* Flood Zone 3 & Flood Map for Surface Water Flooding 1 in 100 year event

**Flood Incident Record**

- Garden (5)
- Historic EA (Pre Sept 2011) (3)
- Internal (38)
- Out building (3)
- ★ Road (9)
- ▲ Tidal (19)

\* Please note this map should not be used to assess flood risk for individual properties, it should only be viewed at a local area scale to give an approximate flood extent. For example small flood defences may not have been incorporated into these flood maps which can influence flood risk.

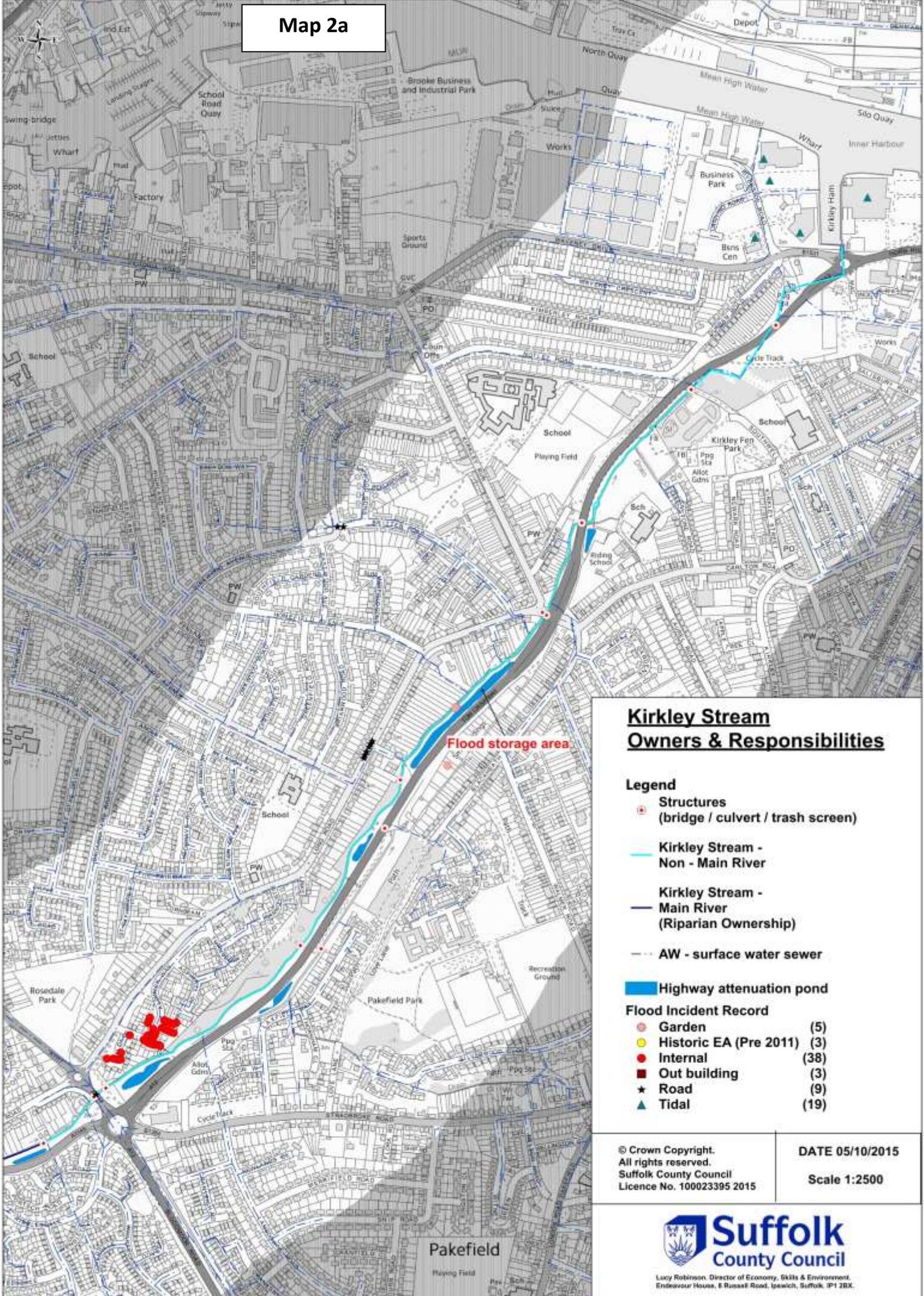
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**Map 2a**



**Kirkley Stream  
Owners & Responsibilities**

**Legend**

- Structures (bridge / culvert / trash screen)
- Kirkley Stream - Non - Main River
- Kirkley Stream - Main River (Riparian Ownership)
- AW - surface water sewer
- Highway attenuation pond

**Flood Incident Record**

- Garden (5)
- Historic EA (Pre 2011) (3)
- Internal (38)
- Out building (3)
- ★ Road (9)
- ▲ Tidal (19)

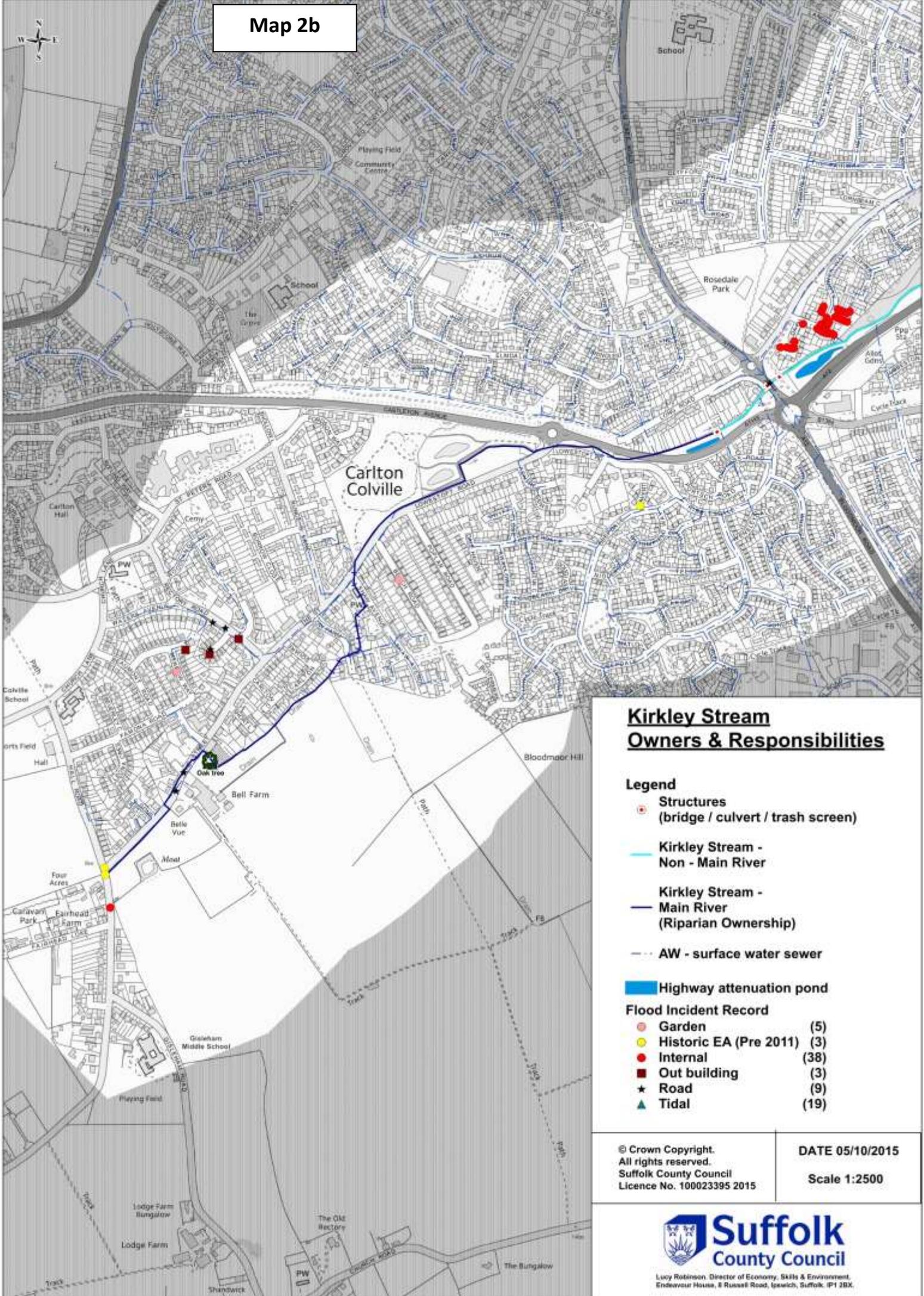
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Map 2b



## Kirkley Stream Owners & Responsibilities

### Legend

Structures  
(bridge / culvert / trash screen)

Kirkley Stream -  
Non - Main River

Kirkley Stream -  
Main River  
(Riparian Ownership)

AW - surface water sewer

Highway attenuation pond

### Flood Incident Record

|                          |      |
|--------------------------|------|
| ● Garden                 | (5)  |
| ● Historic EA (Pre 2011) | (3)  |
| ● Internal               | (38) |
| ■ Out building           | (3)  |
| ★ Road                   | (9)  |
| ▲ Tidal                  | (19) |

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