

## Summary of the 2012 modelling report

### Hoxne Mill

In 2012 a report was commissioned to model the influence of removing several structures along the River Waveney. This was done to help develop our understanding of how these structures impact flood risk.

The structures were modelled as removed because at the time, this was seen as the scenario that could have the greatest impact on flood risk to people and property.

#### The structures at Hoxne Mill

The two structures at Hoxne Mill are:

- The mill sluice located around 70m upstream of the mill buildings at TM1888777839 and shown in Photograph 5 on the Citizen Space web page. This is the structure that we are proposing to withdraw our maintenance responsibility for and transfer ownership to a third-party riparian owner.
- A weir located around 700m upstream of the mill buildings at TM1844478094. This structure defines the split in flow between the mill race and main channel.

#### Structure removal

To remove the mill sluice and weir for the modelling runs, the following changes were applied:

- The mill sluice was removed and replaced with an open channel. The invert level was set as the same level as the bed in the mill race.
- The weir was removed in its entirety leaving an open channel identical in geometry to that found downstream.

#### Summary of results

##### a) Water Levels

Table 1 on page 2 shows the modelled upstream and downstream water levels with the mill sluice and weir removed. Further guidance to help interpret this data can be found in Appendix 1 on page 4.

**Table 1: Upstream and downstream water levels at Hoxne Mill with the mill sluice and weir removed**

RP	<b>U/S water levels (mAOD)*</b>		<b>D/S water levels (mAOD)*</b>	
	Current	Structure Removed	Current	Structure Removed
Q5	21.03	20.95	20.74	20.74
Q25	21.07	21.03	20.84	20.84
Q50	21.09	21.06	20.88	20.87
Q100	21.11	21.09	20.90	20.90
Q200	21.13	21.11	20.93	20.92

\*Upstream water levels were recorded at the point where the flow splits upstream of the mill and downstream water levels were recorded at the confluence downstream of the mill.

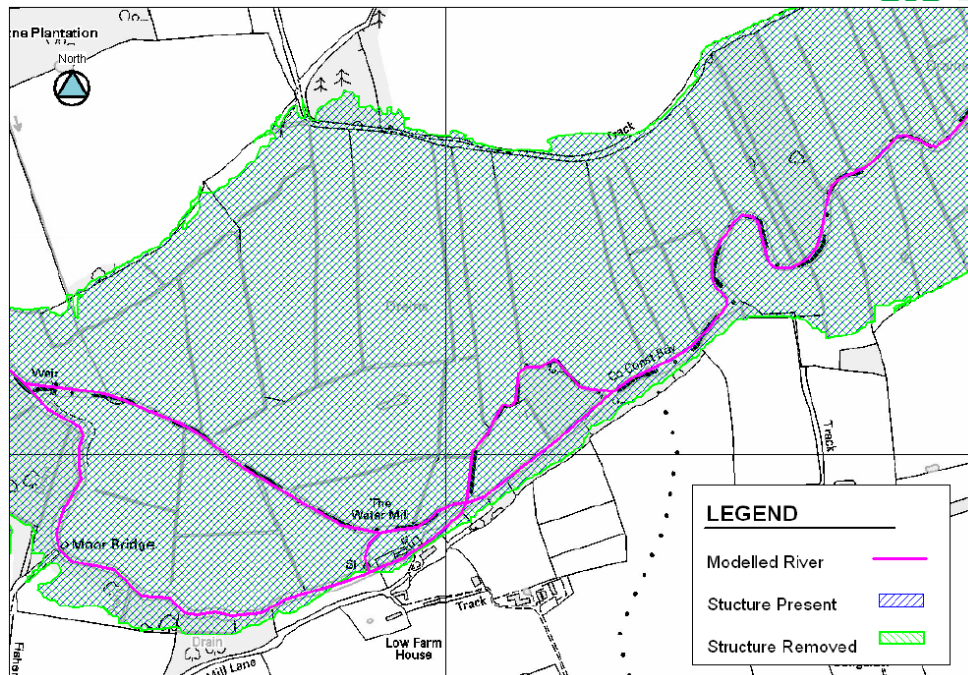
The removal of the two structures at Hoxne Mill slightly reduces flood levels upstream. This is more pronounced for smaller flood events and reaches a maximum of 0.08m for a 1 in 5-year event (20% AEP). Removal of the structures has little impact on flood levels downstream of the mill, with a 0.01m reduction for both the 1 in 50-year flood event (2% AEP) and 1 in 200-year flood event (0.5% AEP).

**b) Flood Extent**

Map 1 shows the flood outline for a 1 in 100-year flood event (1% AEP).

The very small changes in water level described above make no difference to the flood extent for an event of this magnitude.

**Map 1: Flood extent for a 1 in 100-year flood event (1% AEP)**



## Concluding Comments

If the water levels and flood extents do not change significantly when a structure is modelled as removed, this shows that the structure does not provide additional protection to people and property when compared to the natural river channel and is therefore not a key asset in managing flood risk to people and property. This is the case for the mill sluice and weir at Hoxne Mill.

During flood events, most of the flow passes across the floodplain rather than through the structures which therefore do not have a major impact on water levels. In addition, the small changes in water levels identified through this modelling is mostly due to the removal of the weir rather than the mill sluice.

We have recently updated our hydraulic modelling for the River Waveney catchment to include flood extents and water levels for a variety of flooding scenarios, as well as structure removal. We are looking to share this modelling via the Citizen Space web page once the final report is available.

The outputs from this most up-to-date modelling will be used to re-assess the viability of our proposal and ensure that clear guidance is provided to any owner owner/operator if the process goes ahead.

## Appendix 1 - notes to accompany Table 1

U/S	Upstream
D/S	Downstream
mAOD	metres above Ordnance Datum (the height above average sea level)
RP	Return Period, also known as the annual recurrence interval.
Q5	A 1 in 5-year flood event, or a flood event with a 20% chance of occurring each year. This is also known as a 20% Annual Exceedance Probability (AEP) flood event.
Q25	A 1 in 25-year flood event, or a flood event with a 4% chance of occurring each year. This is also known as a 4 % Annual Exceedance Probability (AEP) flood event.
Q50	A 1 in 50-year flood event, or a flood event with a 2% chance of occurring each year. This is also known as a 2% Annual Exceedance Probability (AEP) flood event.
Q100	A 1 in 100-year flood event, or a flood event with a 1% chance of occurring each year. This is also known as a 1% Annual Exceedance Probability (AEP) flood event.
Q200	A 1 in 200-year flood event, or a flood event with a 0.5% chance of occurring each year. This is also known as a 0.5% Annual Exceedance Probability (AEP) flood event.