

## Summary of the 2012 modelling report

### Wortwell 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 Wortwell Mill

The four main structures at Wortwell Mill are:

- The main sluice located upstream of the mill building at TM2809984430. This is shown in Photograph 4 on the Citizen Space web page.
- A fixed crest weir located upstream of the mill building at the top of the mill race at TM2809584455.
- The mill sluice located upstream of mill building within the mill race at TM2816284464. This is shown in Photograph 3 on the Citizen Space web page and is the structure that we are proposing to withdraw our maintenance responsibility for.
- A second mill sluice is located at the mill itself at TM2818684456. This mill sluice is already owned, operated, and maintained by the landowner and therefore is not part of our withdrawal proposal.

### Structure removal

To remove all four structures, the following changes were applied:

- The main sluice was removed and replaced by a spill with dimensions which matched the upstream geometry.
- The width of the fixed crest weir was retained, but the crest was lowered to correspond to the upstream level of the bed.
- The mill sluice within the mill race was removed and replaced with an inline spill, with the same width as the sluice and an invert matching the upstream bed level.
- The second mill sluice was removed and replaced with an inline spill. The width of the opening was retained with an invert level to match the upstream cross-section.

### Summary of outputs

#### a) Water Levels

Table 1 on page 2 shows the modelled upstream and downstream water levels with all four structures 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 Wortwell Mill with all structures removed**

RP	U/S water levels (mAOD)*		D/S water levels (mAOD)*	
	Current	Structure Removed	Current	Structure Removed
Q5	12.18	12.17	12.05	12.05
Q25	12.26	12.25	12.13	12.13
Q50	12.29	12.28	12.16	12.16
Q100	12.32	12.31	12.19	12.18
Q200	12.38	12.36	12.24	12.24

\*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.

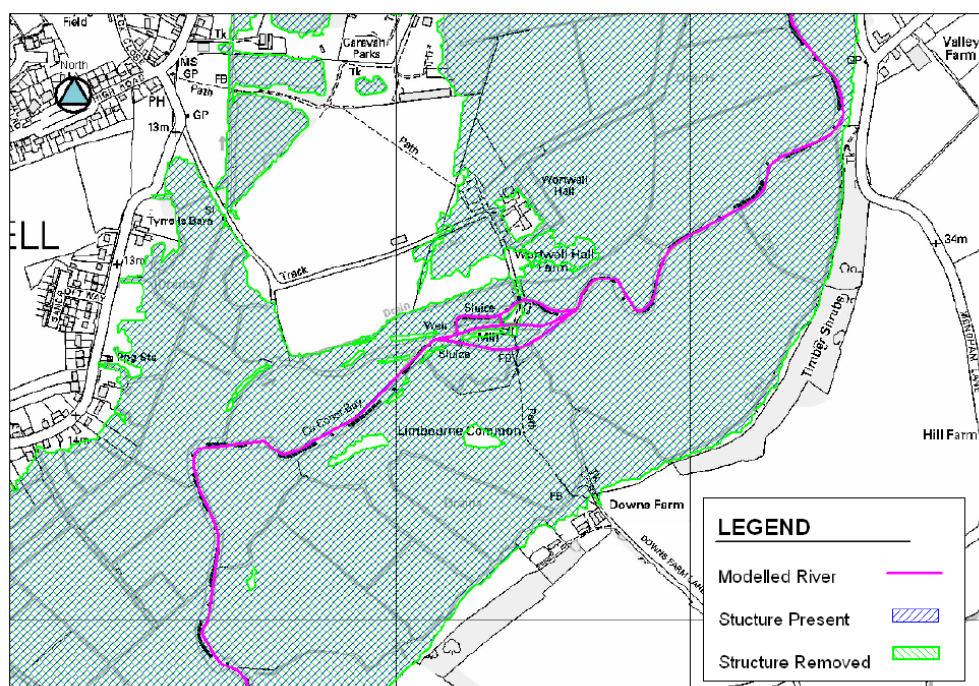
Removing all four structures made little difference to the modelled water levels. Upstream of the flow split the modelled water levels decrease by 0.01m-0.02m. There was no change downstream of the mill except for the 1 in 100-year flood event (1% AEP) where there was a decrease of 0.01m.

### b) Flood Extent

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

The small changes in water level described above make no difference to the 100-year flood outline.

**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 structures at Wortwell Mill.

During flood events, there is significant by-passing of the mill complex on the right-hand floodplain, so the influence of the structures is reduced, especially at high return periods.

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 new 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.