

# FLOOD RISK IN BATH

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1960's flooding in Bath

## Background

Bath is at risk from river and surface water flooding. Following significant flooding in the 1960's the Bath Flood Alleviation Scheme was completed in 1974 to reduce the risk of flooding to the city.

The Environment Agency is responsible for managing the risk of flooding from the scheme, as it is on a 'main' river. This includes inspection of the flood defences, requesting/enforcing maintenance by river owners and carrying out works as appropriate. Bath and North East Somerset Council (B&NES) is the Lead Local Flood Authority and is responsible for managing the risk of flooding from surface water, groundwater and ordinary watercourses.



The Flood Alleviation Scheme through Bath

The Bath scheme significantly reduces the risk of flooding but there are still over 500 properties in Bath with a 1% chance of flooding in any one year (known as a 1 in 100 year flood event). This is predicted to increase to 1500-2000 properties with the impact of future climate change.

In 2004/05 we re-appraised the Bath scheme and the study identified a number of improvement options. However, none provided a sufficiently high benefit to cost ratio to justify being wholly publically funded at that time. Wider catchment solutions to reduce flood risk to the whole of Bath, such as upstream storage or the creation of additional meadow areas, have been investigated but have been found to be not viable.

The 2004/5 study concluded by identifying that schemes to reduce the risk of flooding in certain parts of Bath might be possible if linked with regeneration, as this can assist with funding.

Planning legislation states that development, including flood schemes, must not lead to increased flood risk elsewhere. B&NES, with advice from the Environment Agency, enforces this legislation.

## Bath Quays Waterside Project

The Bath Quays Waterside project, located downstream of Churchill Bridge, reduces flood risk to 103 existing properties and the Lower Bristol Road. This project would not have been financially viable without a link to regeneration work.

The project does not increase flood risk up or downstream and would not stop other flood alleviation works going ahead elsewhere in the city.

## Future work

Work to reduce flood risk is unlikely to be possible from public funding alone in parts of the city where major regeneration is not planned. This is

because the costs, compared to the reduction in flood damage do not provide a sufficiently strong business case to attract public funding.

The Environment Agency and B&NES are working together to re-evaluate options within and outside of the new regeneration areas to ensure flood risk in Bath is managed as effectively as possible. This includes the consideration of the future roles and operation of Pulteney and Twerton gates.



Pulteney Gate

## Siltation

Since the Bath scheme was constructed we have assessed any changes to the channel shape and area through Bath. This has shown a minimal change in area with no significant siltation occurring. This assessment did identify a localised area (at Victoria Bridge) where debris had entered the channel and an exercise was completed in April 2015 to remove a number of cars, bicycles and trolleys from the river.

Survey work upstream of Pulteney Weir has also demonstrated that there is minimal siltation within the channel, with the flow area remaining stable over time. The river channel through Bath is 'self cleansing' which means that almost all sediment entering the river upstream of Bath passes through the city without being deposited on the bed of the river. Based on analysis of historic surveys this was also the case prior to the Bath scheme being constructed.

The lack of any significant siltation through the city means that flood risk from the River Avon in Bath is not increasing over time.

## Operation of Pulteney & Twerton Gates

Pulteney and Twerton gates form part of the Bath scheme. During low flows, these sluices maintain the water level upstream. Pulteney has a single radial gate. Twerton has a vertical and a radial gate spanning the river. A minimum water level is required for navigation purposes, as well as for protecting the ancient foundations of buildings along the river corridor in the World Heritage area of Bath. However, during high flows, the sluice gates are opened. The operation is automatic and reacts to changes in river levels. This means that as river levels rise, the gates gradually open and allow flood flows to pass through Bath. The gates do not hold back flood water and then suddenly release it. Flood water arrives at the gate and continues downstream as it would do naturally.



Twerton Gates

Twerton and Pulteney sluice gates are at least 40 years old and require significant (and increasing) investment to keep them reliably operating.

## Bath River Avon Options Appraisal

The Environment Agency and B&NES have commissioned a study to consider the best long term sustainable solution for both Pulteney and Twerton gates as part of a holistic flood risk management scheme in Bath. This approach makes it possible to achieve wider benefits, allowing stakeholders and funders to influence and invest in the scheme as a whole. The appraisal included all environmental, flood risk and amenity constraints and opportunities.

The final report for this initial phase was received and signed off by the Council's Strategic River Group in March 2015. This, alongside subsequent work, has demonstrated the key flood risk benefits that can be obtained from improvements at Twerton Gates as well as the other benefits that can be obtained by works at Pulteney and new or improved flood defences elsewhere in the city. All

options proposed for further study reduce flood risk through the City.

## Next Steps

The work to date has focussed on identifying potentially viable schemes and the likely scale of funding that would be required to implement them. This work will be summarised in reports due in Summer 2015. Securing funding remains a key challenge.

If the identified schemes are agreed to be worthy of further investigation then the next stage of work will involve more detailed assessment. This will include a more thorough appraisal of the hydraulic impacts of any work, especially at Pulteney, detailed economic analysis to try and secure funding and consultation with the public and any affected landowners. Ultimately any scheme at Pulteney will also need planning permission. The earliest this process is likely to be complete is 2016, and there would be further wide-ranging public consultation events during this period.



Pulteney Weir and Gate

## Preparation for Flooding.

Flooding is a natural phenomenon that can still occur where flood alleviation is in place. The Environment Agency and B&NES work in partnership with emergency services and communities to prepare for flooding.

To find out if you are at risk of flooding please visit our website link below. <http://apps.environment-agency.gov.uk/wiyby>

Communities, residents and businesses are encouraged to register for the EA's Flood Warning

service and to consider the community and personal flood plan guidance that is available on the EA's website.

Flood Warning registration link:

<https://fwd.environment-agency.gov.uk>

Community Plan guidance link:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/292939/LIT\\_5286\\_b9ff43.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292939/LIT_5286_b9ff43.pdf)

Personal Flood Plan guidance link:

<http://apps.environment-agency.gov.uk/flood/151256.aspx>