ITEM 8

Somerset Rivers Authority (SRA) Board Paper

River Brue Modelling

RECOMMENDATION

The Somerset Rivers Authority (SRA) Board is asked to:

1. Review and comment on modelling outputs, progress and next steps.

Purpose of the item

To provide the Somerset Rivers Authority (SRA) Board with an update on the latest phase of River Brue modelling work and to outline this project's next steps before a final report is due in December.

Background and context

Weather events over the last two winters have further highlighted the degree of flood risk within the lowland Brue catchment, with properties, land and highways being at risk. Recent years have seen some of the highest flows on record into the lowland area of the catchment. Whilst there have been various ideas put forward over the years for works that may reduce this risk, some of these have not been able to proceed due to a lack of information on what the impacts would be, especially in terms of any subsequent increase in risk in other areas.

SRA partners have been debating what is feasible and affordable to reduce the risk and impacts of flooding in the lower Brue for several years. In recent years, efforts were invested in development of an improved hydraulic model, allowing for data to be collected to demonstrate the impacts of any changes within the system. This evidence is essential if projects to address flooding concerns are to get consent to proceed.

At the September 2024 SRA Board meeting, approval was given to develop the River Brue model further to allow simulation of different scenarios to test which ones provided the optimum flood risk reduction. The scenarios, which have all now been represented in the modelling, are across the lowland catchment, including specific interventions in the lower Brue to increase the capacities of the channels. Understanding the flood risk reduction impacts of any scenario must be considered alongside the engineering, environmental and economic impacts of the preferred options. This suite of information can then be analysed to allow a simple business case to be developed.

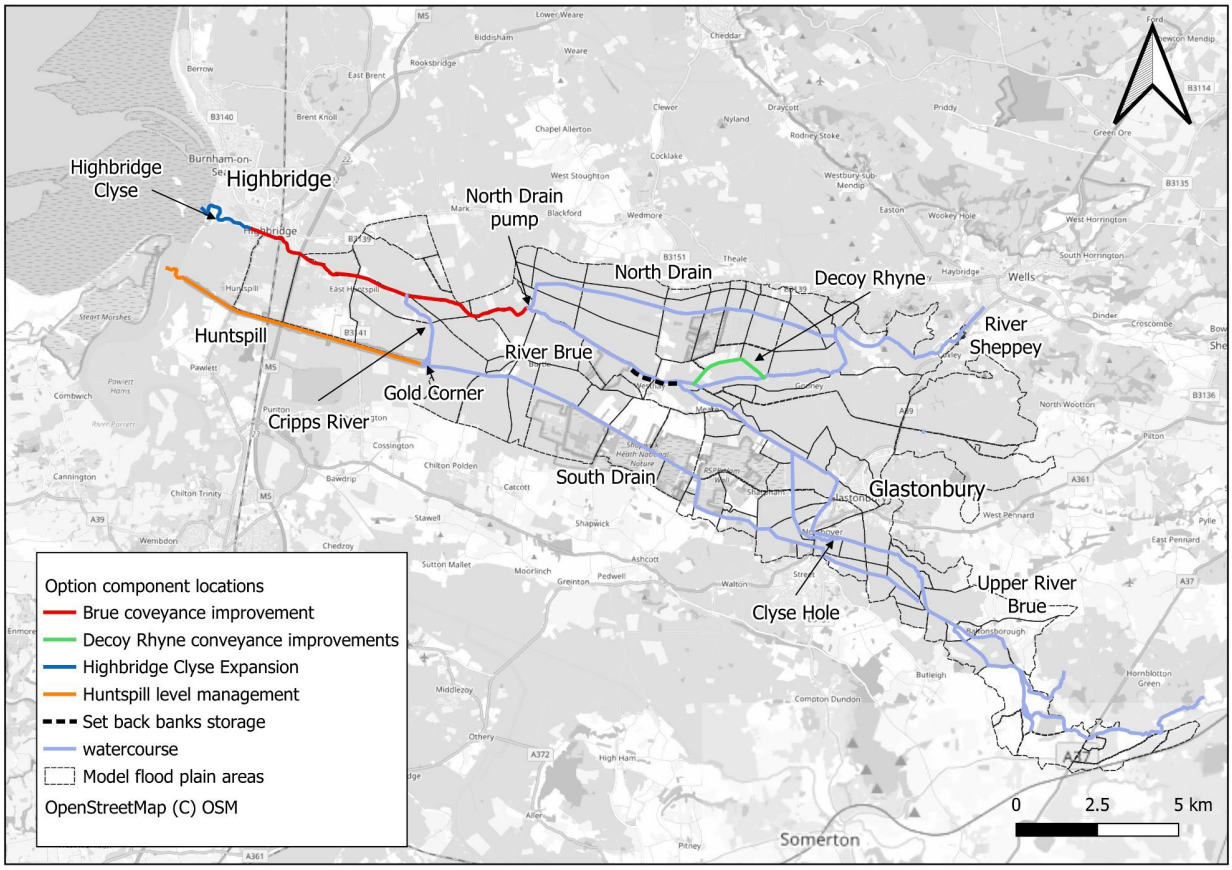
WSP were appointed to undertake the project in January 2025.

Latest status

The modelling work is now complete with final outputs having been produced. The table below shows all the main scenarios that have been tested individually within the model, along with the conclusion of whether they provided an overall flood risk benefit or not (indicated by a positive result). From these scenarios, the key ones were taken forward to produce a series of combined options involving two or more of these scenarios, with more detail on these being presented at the September meeting. These outputs are encouraging in demonstrating different options that could allow more water to be evacuated from the system in high flow events, including in the catchments that are reliant on pumping for evacuation of floodwater. The outputs generally show greater benefits to the lowland catchment from undertaking work within that area, rather than further up in the catchment. The nature of this catchment is such that flood risk is principally a function of the volume of water reaching the lowland areas, combined with the ability of the catchment to evacuate water during low tides. Whilst works to slow the flow of water in the upper catchments can have great benefits further up the catchment, as they do not significantly reduce the volume of water passing downstream, they have minimal benefit in this lowland catchment. There are also actions, if undertaken on their own, that can lead to detrimental impacts elsewhere. For example, if works are undertaken on their own upstream of Westhay they can result in increased flooding downstream.

Option	Positive result?
Lower Brue conveyance components	Positive
Lower Brue conveyance combined	Positive
Highbridge Clyse expansion	Positive
Brue Banks low spot sense tests	No Negative Impacts
Upstream flow slowing	No
Mid Brue conveyance improvements	Positive
Decoy Rhyne conveyance improvements	No Impact
North Drain conveyance improvements	No Impact
Huntspill River level management	Positive
Clyse Hole weir removal	Negative Downstream Impact
Cripps River conveyance	No Impact
Set back banks storage	Positive

The locations of the main scenarios are shown in the figure below. The set-back banks option is an indicative location only and could be achieved at multiple locations within this river system.



The scenarios have been divided into short, medium and long-term options, which could be considered as works that could be undertaken typically within 1 year, 1-5 years and more than 5 years, although this is dependent on a number of factors. For the short-term option, an assessment has been made of filling in localised low spots within the banks to the same level as the adjoining bank. The modelling demonstrates that this can be done with no impacts on peak flood levels elsewhere in the rivers and a small reduction in flood risk to the field areas behind these banks, indicating therefore that the low spots in these banks can be repaired without danger of causing a detrimental impact to third parties.

For the medium-term options, the scenario that on its own shows the greatest flood risk benefit, and will be taken forward for further analysis, is improving the conveyance of the River Brue channel between Cripps River and Highbridge Clyse, followed by conveyance improvements on the Brue between Westhay and Cripps River. This is based primarily on the removal of pinch points within the river channel, caused by

localised encroachment, bank slumps and vegetation growth rather than wider scale desilting, but this will be informed by updated survey data.

The other main options that are being taken forward for further analysis are:

- Lowering the retained water level in the Huntspill prior to a flood event. This can provide some significant flooding benefit, but there may be important environmental factors that limit how far water levels can be lowered, thus constraining the flood risk benefit achievable.
- Increasing the opening size of Highbridge Clyse. This will be a more challenging option in terms of construction, but increasing the size of opening at Highbridge Clyse would allow greater flow through at low tides and reduce upstream risk.
- Floodplain storage / set-back of banks. This would require deliberate, and more frequent flooding of certain areas, but if done in the right location this could reduce flood risk elsewhere. Setting-back the banks would also allow the banks to be strengthened.

Other options considered, including undertaking conveyance improvements on other watercourses (e.g. North Drain, Decoy Rhyne), have minimal if any hydraulic benefit during flood events.

The longer-term options are those which will require the greatest changes within the system, and where the flood risk benefits are unlikely to be the primary reason to undertake works, so a business case would need to identify a wider set of benefits to make the case for investment. One key option that could be included in this would involve changes to the watercourses around Clyse Hole. There is opportunity to modify or remove the main structures at Clyse Hole to provide flood risk, operational and environmental benefits. This could also include works on Glastonbury Millstream and South Drain. There is also the option to divert more flow into the South Drain during flood events, which may benefit other parts of the lowland Brue catchment whilst also providing environmental improvements.

The estimated expenditure for this stage of the River Brue modelling project (including the work required to complete the modelling and produce the final reporting) is currently forecast to be £95,000, which includes all the time from the different organisations to the project.

NEXT STEPS

The next steps on this study will be to take the outputs from the scenario testing for the medium-term options and do a short appraisal of the engineering, ecological and environmental opportunities and constraints.

An assessment of the costs and benefits will be undertaken, which will look at all benefits (or disbenefits) including flood risk, environmental and social.

Sufficient data will be presented to allow a simplified outline business case to be produced as part of any future study. This is a short report that is necessary to apply for funding to be able to implement these options. The format of any business case will need to be tailored to meet the requirements of whichever funding is being applied for.

At present it is not clear what other funding sources may be available to support this other than SRA funding. Building a positive business case for investment in rural areas is challenging because the methodology tends to focus on numbers of properties and extent of strategic infrastructure better protected. This is not to say a positive case cannot be made but it is likely that it would need to support wider strategic goals to attract funding from sources other than just flood risk funding.

A final report will be presented to the board in December. This will represent the point when the commitment the SRA made to improve the understanding of flood risk within the lowland Brue has been met. The final report, and supporting evidence base, represent a major step forward in the lowland Brue catchment as it will enable an organisation, or organisations, that wish to implement any of the scenarios to progress that work. For scenarios to be progressed an organisation will need to take the lead on securing funding, securing permissions, and undertaking detailed design and implementation.

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Date: 2 September 2025
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