

Research Brief

Evaluating Natural Flood Management in the River Isbourne Catchment

Natural Flood Management (NFM) has emerged as an important component of flood risk management policy in the United Kingdom, particularly as climate change increases the frequency and intensity of rainfall events. This policy brief combines hydrological evidence and stakeholder perspectives from the Isbourne Catchment in Gloucestershire and Worcestershire, approximately ten years after the initiation of NFM interventions. Researchers from the University of Gloucestershire (Geography and Countryside and Community Research Institute) have been involved since the inception of the project, producing the original feasibility report (Clarke, Short & Berry, 2016), as well as periodic research-based contributions to understanding the management of the catchment (Clarke & Short, 2017; Smith, 2017; Smith, Berry & Clarke, 2020) however the results presented below relate to analysis conducted by two undergraduate dissertation research projects in 2026. Together, the findings provide evidence that NFM can reduce flood risk while also demonstrating the critical role of community leadership, stakeholder collaboration, and landowner participation in achieving successful outcomes.

The hydrological analysis found a relationship between the implementation of NFM measures from 2016 onwards (171 leaky dams constructed) and improved flood response characteristics within the catchment since then. Median peak flow for the top ten events fell 31% after implementation (95% confidence). Following implementation, peak flows and event discharge decreased in response to precipitation-based events, while lag times increased (median lag from event to peak flow increased from 0.5 days to 1 day (95% confidence)), indicating that runoff was slowed and the magnitude of discharge responses reduced (70 per cent of events recorded a delay). These findings suggest that NFM has been effective in attenuating river flows during low- to medium-magnitude rainfall events, with potential benefits for reducing flood risk. However, the evidence also indicates that NFM may be less effective during extreme rainfall events, particularly when antecedent ground conditions are already saturated. Given the limited occurrence of extreme events since implementation, further monitoring is required to establish the statistical significance of this aspect and the thresholds at which NFM measures may be exceeded.

Alongside the physical evidence, stakeholder interviews with community representatives, flood management professionals, and landowners revealed strong support for NFM and widespread agreement that it has generated positive outcomes. Participants highlighted reduced flooding, lower implementation and maintenance costs compared with traditional engineered solutions, and wider environmental benefits. The project demonstrates how community-led action can catalyse catchment-wide flood management initiatives and encourage long-term behavioural change among landowners.

A key finding is that the success of the Isbourne project has relied as much on social coordination as on physical interventions. The conditions necessary for implementation at scale included the establishment of a catchment flood group (engaging 14 landowners amongst other stakeholders), strong community leadership, and collaboration between local residents, practitioners, landowners, and flood management professionals, as well as partnership with the University of Gloucestershire. Increased landowner participation over time was supported by financial incentives and visible evidence of successful interventions elsewhere in the catchment. Nevertheless, stakeholders identified access to land and long-term maintenance responsibilities as ongoing challenges.

Overall, the evidence suggests that NFM should be viewed not only as a set of technical interventions but also as a collaborative governance approach. These initial reports provide evidence that the Isbourne catchment provides a practical model of collective action that could be adapted and replicated in other catchments. Further investment is required to provide a complete evaluation of the current implementations, long-term effectiveness of both NFM intervention methods and their management. For example, stakeholders considered interventions beneficial, but quantifying water attenuation and overall impact remained difficult. The ultimate aim is to create cost-effective, environmentally sustainable and transferable flood risk reduction strategies in the Isbourne and other catchments.

Source material

The students' work was supervised and very highly rated by academics at the University of Gloucestershire with expertise in these areas. Both have been nominated by the course team for national Royal Geographical Society awards. They are attached with this report in-full with the students' permission.

Arkle, Andrew (2026) *Exploring experiences of a Natural Flood Management project on the River Isbourne from stakeholder perspective*. University of Gloucestershire Dissertation for BA (Hons) Geography. Supervised by Prof. Kenny Lynch.

Godfrey, Emma (2026) *Evaluating the effectiveness of natural flood management implemented within the Isbourne catchment*. Dissertation for BA (Hons) Geography. Supervised by Dr Ceri Davies.

Earlier publications

Clarke, Lucy E. and Short, Christopher (2017) *Isbourne Catchment Community Report: Potential for Natural Flood Management in the Catchment*. Technical Report. University of Gloucestershire, Cheltenham.

Clarke, Lucy E, Short, Christopher and Berry, Robert (2016) *Isbourne Catchment Project: Scoping Study (Final Report), Report to Isbourne Catchment Partnership & Environment Agency*. Technical Report. University of Gloucestershire, Cheltenham.

Smith, Katherine L. (2017) *Investigating the potential of 3D visualisation to enhance stakeholder engagement in natural flood management*. Masters thesis, University of Gloucestershire.

Smith, Katherine, Berry, Robert and Clarke, Lucy E (2020) *Exploring the potential of Google Earth as a communication and engagement tool in collaborative Natural Flood Management planning*. Geographical Journal, 186 (2). pp. 171-185. doi:[10.1111/geoj.12323](https://doi.org/10.1111/geoj.12323)

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