

Local factors in managing flood and coastal erosion risk and property flood resilience
Defra Call for Evidence
Blueprint for Water Response: March 2021

Link's Blueprint for Water Group has responded to particular questions from the Call for Evidence document, where the expertise of our members can add particular evidence.

Q14: In addition to developing a measure on local economic circumstances, what other approaches could provide better flood and coastal erosion resilience for economically vulnerable and small communities in the flood and coastal defence programme?

Natural Flood Management is a key set of measures which can reduce flood risk in small communities, especially where large scale "traditional" schemes would not be viable or qualify for Grant in Aid.

Natural flood management encompasses a variety of potentially low-cost techniques that use opportunities in the landscape to reduce flooding. These measures seek to increase water storage (e.g., floodplain reconnection) and infiltration (e.g., storage capacity of soil) and/ or slow and disperse water flows. The latter can be achieved by increasing the 'roughness' of the ground surface (e.g., planting vegetation) and through the use of in-river features (e.g. leaky woody debris dams) to reduce peak flow ('attenuation'). Natural flood management also provides additional benefits including biodiversity and improving water quality.

Floodplains, ponds, wetlands and aquifers are an integral part of a resilient river, which can moderate flows, absorb excess nutrients, enhance biodiversity, and sequester carbon emissions. Government should require the use of natural flood management to complement and replace engineering solutions where practical, and make provision for space for water in the landscape. We would like to see natural flood management as a mandatory component for accessing FCERM funding for flood defence. The inclusion of NFM measures can also attract other, complementary funding sources, such as has been investigated for the [River Wyre](#).

However, it is also important that NFM-only projects are funded separately in order to support vulnerable, small communities that can't access other funding. Appropriate accessible, project-flexible funding mechanisms with relevant guidance is needed.

We recommend a strategic approach to catchment scale natural flood management, identifying both appropriate sites for NFM and the most appropriate natural flood measures to be used at those sites. This is necessary to employ successful, cost-beneficial measures and ensure additional biodiversity benefit. This could form part of opportunity mapping for local nature recovery strategies. Such strategic planning should then provide the basis of advice for ensuring NFM delivered through ELM is effective and site appropriate.

Example: Using Citizen Science to identify NFM opportunities.

An [opportunity mapping tool](#) has been developed for Natural England which allows Citizen Scientists to identify opportunities for river restoration. A similar approach could be taken for natural flood management opportunities, such as by identifying opportunities to address localised erosion issues, change a flow path or reduce runoff from a source area. This would allow vulnerable communities to identify NFM opportunities which could be delivered by local Catchment Partnerships. As with the river restoration tool, opportunities will ideally be 'moderated' by officers with local expertise in

flood risk so that the most promising opportunities prioritised for FCERM funding and the intervention developed and delivered in partnership with the community.

We set out below a number of examples where natural flood management has been used successfully to reduce flood risk for small communities where funding for more traditional hard schemes is not available.

Wildfowl & Wetland Trust West Somerset NFM

In 2018 WWT initiated a natural flood management project in the Two Valleys area, around the Doniford and Monksilver streams in West Somerset. In this area the risk of river flooding is heightened by the confluence of the Monksilver Stream with the Doniford Stream immediately downstream of Williton. One of 15 Government funded pilots, WWT, together with their partners, restored natural features across the catchment that have been lost or replaced over time by man-made structures. Emulating the natural functions of the catchment, floodplains and rivers these measures hold back and slow water flow reducing the risk of flooding downstream. Measures include creating 10 new open water wetlands, one wet woodland and floodplain reconnection, installing 166 'leaky dams', and planting over 3,500 trees. Working with farmers to manage their land in ways which reduce surface water runoff is a paramount part of WWT's work to reduce flood risk. Eighty properties were at risk of flooding prior to the interventions. It is unlikely that this small community would have successfully applied for a more traditional scheme via Grant in Aid. Data is still being analysed around reduced peak flows and other multiple benefits.

Wildlife Trust nature reserves in the North West

A number of the Wildlife Trust for Lancashire, Manchester and North Merseyside's nature reserves are [managed to provide floodwater storage](#) as well as habitat for wildlife. In January 2021, serious breaches of the banks of the River Alt saw thousands of gallons of water flooding into the Lunt Meadows Nature Reserve in Merseyside. The water levels rose so high that not only the meadows but parts of the car park were flooded, but this capacity meant that major problems were prevented in nearby Sefton and Maghull. The reserve provides habitat for species such as water vole, marsh harrier and kingfisher, while also holding excess rain and river water, which is either then absorbed by plants and soils, returns to the atmosphere or is slowly released back into the River Alt, taking the pressure off drains and reducing the likelihood of flooding in more built-up, urban areas. Recent work at Bickershaw Nature Reserve in Wigan has created a similar water storage pool on the site, reducing local flood risk. Bickershaw's flood management was designed and implemented by Wigan Council, the Environment Agency and the Wildlife Trust, which manages the site. Floodwater storage areas at Bickershaw and in nearby Lightshaw Meadows totalling 50ha filled up with water during Storm Christophe, preventing damage to more than 100 properties on the Common Lane Brook area of Westleigh.

Lower catchment NFM at Clifton Ings & Rawcliffe Meadows, Yorkshire¹

In York, 3,400 homes and businesses experience flood risk. As green spaces were lost to development in the 1980s, flood storage capacity in the wider landscape was lost. Flood storage capacity was increased at Clifton Ings, via the construction of additional embankments and water control structures, forming a reservoir. At Rawcliffe Meadows, the pasture was restored to traditional hay meadow from 1990 onwards. The washlands and floodplains upstream of York offer flood storage that can help to lower the peak level in the city. However they do so to different extents and at vastly different costs. Clifton Ings holds 2.3 million cubic metres of water, but cost £1.25M (1982) to construct. Floodplain Meadow restoration and management by contrast can be undertaken for much smaller amounts; Rawcliffe Meadows used to be formally managed by Friends

¹ Unpublished case study, WWT

of Rawcliffe Meadows with expenditure of a few thousand pounds a year, with wider benefits for biodiversity and water quality; the site is a SSSI and Floodplain meadows have been found to trap up to 40 tonnes of sediment per hectare from a single, large flood event.

RSPB St Aidans Reserve

St Aidan's and Fairburn Ings, Aire Valley, Leeds At St Aidan's in the Lower Aire Valley, the RSPB, the Environment Agency and Leeds City Council have created an inland 400-hectare wetland by adapting a former open coal mine into a nature reserve with natural flood management benefits for the communities of Allerton Bywater, Castelford and surrounding villages. The team at St. Aidan's work with the Environment Agency to monitor water levels, water quality and the impact of the site on mitigating local flood risk. It can currently store 7.5 million cubic metres of flood water and can reduce the downstream flood peak by 400mm by storing and slowing the flow of floodwaters. This is monitored to ensure that the site is as effective as possible in storing flood water.

Medmerry Nature Reserve, Selsey Peninsula, West Sussex

Medmerry is one of the largest open coast managed realignments in Europe. It is a multi-objective scheme, providing cost effective flood risk management for 348 properties, the local water treatment facility and the only road to a local town servicing 5,000 residents from flooding. This natural 'buffer zone' absorbs strong waves to reduce the strength and length of peak water levels and erosion from storm surges. The reserve has also created 183 hectares of intertidal habitat, providing home for species such as avocets, shoveler ducks and wintering waders. The managed realignment project at Medmerry was completed in 2013 at a cost of £28m to the Environment Agency. Around £90m of direct economic benefit is expected from the scheme. Maintenance costs are now far less than for the old shingle bank. The local economy has received a boost from an increase in green tourism and the caravan parks have been able to extend their season, generating income and jobs. This is in addition to the estimated the value of ecosystem service impacts of the scheme to be £2.95m per year, with a present value (PV) of £89.7m over 100 years. This excludes the economic benefits of flood protection, estimated within the business case for the scheme at £78.2m in PV terms over 100 years. The ecosystem services included in this valuation included climate regulation, recreation and tourism, existence, fish and agriculture.

Q32 What, if any, are the anticipated difficulties with collecting data against the additional items in Figure 5 (page 31 of the Call for Evidence document)? What are the reasons for the difficulties and how could they be overcome? In your response, please outline which specific datum you are referring to.

Q33 What, if any, additional data (other than those in Figures 4 and 5 (30 and 31) of the Call for Evidence document) could be recorded to monitor improvements and report progress of our flood and coastal defence programme? In your response, please detail what these data will help to track and what readily available sources could be used to support the provision of these data.

There is now a substantial body of evidence that NFM techniques can reduce flood risk such that in the [Working with Natural Process Evidence review](#), John Curtin Executive Director, FCRM said "...Natural Flood Management approaches can help to reduce flood risk... The more difficult question to answer is "how can Natural Flood Management approaches be used most effectively?" This suggests that the efficacy of individual NFM measures need not be measured and monitored within

every single NFM scheme, reducing the burden on practitioners who are often seeking to implement schemes with limited funding. Instead, any monitoring should seek to target more specific research questions, and be funded accordingly; for example, what is the impact of NFM measures on improving water security and increasing drought resilience? What role can NFM measures play in groundwater-dominated catchments compared to where surface water is the primary source of flood risk? These larger-scale questions are unlikely to be satisfactorily answered by monitoring at individual asset scale.

However, often it is cited that ongoing maintenance and management costs are unknown when considering natural flood management. In order to address this gap such data should be collected at asset / project scale, potentially through involving the local community being protected by the flood measures.

This information could be recorded using the [NFM Projects Monitoring and Evaluation Tool](#) developed to coordinate monitoring and evaluation of the 26 catchment-scale projects and 34 community-led projects funded under Defra's £15 million natural flood management (NFM) scheme.

This response is supported by the following Link members:

- The Wildlife Trusts
- RSPB
- The Rivers Trust
- Wildfowl and Wetlands Trust

For further information, please contact Wildlife and Countryside Link:
Ellie Ward Policy and Information Coordinator
E: eleanor@wcl.org.uk