



# Natural Flood Management Programme: Interim Lessons Learnt

Report January 2019

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# Foreword

Natural Flood Management is already a useful tool for managing flood risk and improving the environment. The challenge is to continue to learn how to use it effectively.

Approaching flood risk with softer engineered solutions is not new to flood and coastal risk management practitioners. For years, many of our beaches have been managed to take the energy out of stormy seas to protect our coasts, and in the northeast of England, for generations flood water has been stored in catchments on the “Ings” – an Old Norse word for flood meadows. We're still using these kinds of approaches today. For example, reconnecting rivers with their natural floodplain to make space for water away from vulnerable built-up areas is an important element of flood risk management projects in Oxford and Leicester.

What is new is a better understanding of how we can work collaboratively to provide the most effective blend of solutions. Too often, the conversation has been about a false choice between hard or soft engineering – as if there were conflict or competition between them. Better understanding can help provide long-lasting protection from the worst impacts of flooding by complementing flood defence walls and embankments with measures across a catchment that can store and slow flood waters and mitigate for the emerging effects of climate change.

It is easy to over-simplify questions about Natural Flood Management and ask "does it work?" Our evidence directory was published in October 2017<sup>1</sup> and tells us that Natural Flood Management approaches can help to reduce flood risk but that they are rarely enough to make a step-change in the risk faced by communities and businesses alone.

The more difficult question to answer is "how can Natural Flood Management approaches be used most effectively?" This interim lessons document begins to answer that question by identifying the key challenges that the people involved in the £15m programme of Natural Flood Management projects have faced and sharing some of the emerging experiences about what appears to work best. The programme will continue until March 2021. Working together with communities, landowners and other partners we are already doing some great work. We are still learning.

John Curtin

Executive Director for Flood and Coastal Risk Management

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<sup>1</sup> <https://www.gov.uk/government/publications/working-with-natural-processes-to-reduce-flood-risk>

# Executive summary

Natural Flood Management (NFM) provides the opportunity to manage flood and coastal erosion risk by protecting, restoring and emulating the natural processes of catchments, rivers, floodplains and coasts. In the 2016 Autumn Statement the government announced £15m to learn more about these interventions. This funding was allocated to 60 projects across England, creating the NFM programme. The objectives of the programme are reducing flood and/or coastal erosion risk, improving habitats and biodiversity, contributing to research, and promoting partnership working.

The "Working with Natural Processes Evidence Directory" tells us that NFM approaches can help to reduce flood risk. There are an increasing number of projects that have included or plan to include NFM features. Examples of these include well known work at Pickering and Stroud along with planned work in Oxford.

We have identified 40 projects in the Environment Agency's Flood and Coastal Erosion Risk Management current investment programme that include NFM measures as part of their solution. We want to learn more about NFM, to have more confidence in it, and be able to use it as one of the tools to reduce flood risk. The NFM programme will enable this.

The 25 Year Environment Plan states that we will learn lessons from the NFM programme. This interim lessons learnt report is the first in a suite of 3. This report specifically looks at the lessons from developing and starting the programme.

The lessons are based on 122 responses from data collected via an on-line survey during the first two weeks of September 2018 from the networks of project managers and NFM practitioners who are taking part in the NFM trials.

This report groups the findings into 4 themes: Developing a programme, Valuing benefits and project assessment, Partnership working, and Responsibilities and maintenance.

Five key lessons this work has found are:

1. Project teams require clarity on how projects proposals will be assessed and the steps that need to be taken to deliver their project, before proposals are invited. Additional support is needed for organisations who have limited experience in dealing with public money.
2. Project teams were asked to commit to particular NFM interventions and an overall timetable up-front. NFM projects need to be adaptable in their approach, and should not be seen as fixed before practicalities have been agreed with local people.
3. Project teams found it difficult to produce evidence of the benefits proposed as part of their business cases for NFM investment. Teams would like further information and expertise in how to assess and value the benefits and costs of NFM work.
4. There is a clear need for investment of time and funding in engagement. Engagement is crucial to gaining support from landowners and other local people, and to forming and sustaining the partnerships needed for NFM.
5. Engaging with landowners and managers to agree details of NFM works and clarify responsibilities is critical. Designs and timings can change as a result.

We have identified a total of 16 lessons, each with associated actions. These actions are not all for the Environment Agency to deliver, however, we will take an overview role to ensure their progression.

We will issue a further interim lessons learnt report in autumn 2020. This will focus on the completion of the interventions and where possible, how effective they have been. Evidence of the effectiveness of some of the interventions in this programme will require long term monitoring, and will be used to update the "Working with Natural Processes Evidence Directory". We plan to update that directory from 2021 when this NFM programme is complete and further evidence from other academic studies becomes available.

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# 1. Introduction

Natural Flood Management (NFM) helps manage flood and coastal erosion risk by protecting, restoring and emulating the natural processes of catchments, rivers, floodplains and coasts. These techniques include the re-meandering of rivers, the restoration of wetlands and targeted woodland planting and can be used in conjunction with more traditional hard engineering options.

We know that NFM can reduce flood risk, build resilience into hard defences, and reduce the impacts of climate change. The "Working with Natural Processes Evidence Directory<sup>2</sup>" published in autumn 2017 sets out the evidence. There are many examples of NFM projects that have been delivered, or are in preparation across England including schemes to reduce flood risk in Pickering, Stroud and Leicester. In 2017-18 we identified 40 projects in the 6 year flood and coastal erosion risk management (FCERM) investment programme including NFM measures.

The Government announced £15m funding for the development of NFM in the 2016 Autumn Statement. The funding was allocated to 60 projects in July 2017 to form the 'NFM programme'. The 60 projects are split as 26 Catchment Scale (led by Flood Risk Management Authorities) - and 34 Community Scale projects - led by community groups and charities. The programme runs until March 2021 and each project needs to demonstrate how it contributes to the Defra Funding Criteria in [Annex 1](#), but summarised here as 4 objectives of the programme:

- reduce flood and/or coastal erosion risk
- improve habitats and increase biodiversity
- contribute to research & development by reducing the evidence gap for NFM
- promote partnership working.

The 25 Year Environment Plan states that we will learn lessons from the NFM programme. This interim lessons learnt report begins that process and captures the lessons and good practice learned from the programme so we can share them and embed them as part of business as usual activities. This is the first report in a series which includes the learning from this pilot programme. The lessons in this report are from the perspectives of the Environment Agency, other risk management authorities, communities, land managers, partners and stakeholders.

## Learning from the whole programme

We plan to gather evidence to see how well NFM interventions stand up against other measures, and capture lessons throughout the NFM programme:

- First interim report (this report, January 2019): to capture lessons from developing and funding the programme of NFM projects.
- Second interim report around autumn 2020.
- Final report 2021: a review after the NFM projects have been delivered and describe how findings will be used to revise the NFM evidence base.

We will continue to work with other organisations, including professional bodies and research organisations to supplement the NFM evidence base.

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<sup>2</sup> <https://www.gov.uk/government/publications/working-with-natural-processes-to-reduce-flood-risk>

## Programme Highlights

The NFM programme is expected to achieve outcomes shown in *Figure 1.1*, with 60 projects being delivered across England working with more than 85 partners. The programme has attracted £5.4m of funding contributions, and more than 1,700 ha of habitat and 300 km of watercourses will benefit by being restored or created.

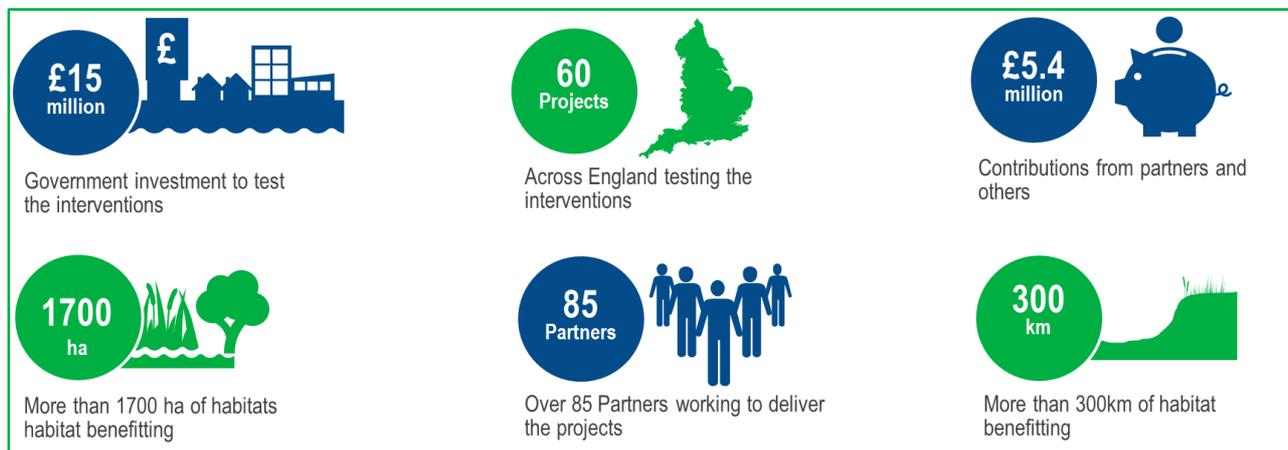


Figure 1.1: NFM Programme statistics

### Programme Success

The programme has enabled the Environment Agency to set up and run a programme of 60 projects with a range of small community and charity groups to deliver flood risk benefits.

The Environment Agency have adapted their process, and moved quickly to set up and run a competition for local groups and charities to deliver NFM interventions. Alongside this, other innovations to support NFM are being trialled such as reverse auctions.

Community groups and Charities are leading projects. They have set them up and some are already on the ground in a short time.

### Lessons Learnt: Methodology

We invited 60 NFM project managers, plus a wide supporting network, to complete an on-line survey during the first two weeks of September 2018. The survey generated 122 responses. Most of the information collected was quantitative, with a number of qualitative free text questions.

We also included contributions from other relevant research projects including 'Enablers and Barriers to NFM', being led by Defra.

This report groups a number of chapters into 4 themes, which are: Developing a programme, Valuing benefits and project assessment, Partnership working, and Responsibilities and maintenance.

## 2. Developing a programme

### Introduction

The timetable followed for developing the programme is in the table below.

Date	Milestone	Action
April 2016 - November 2016	Government allocate £15m of Flood and Coastal Erosion Risk Management (FCERM) Grant-in-Aid (GiA) funding to pilot NFM interventions in England.  Secretary of State announced £15m for a pilot programme of NFM interventions.	EA worked with Defra to agree criteria.  EA worked with other Flood Risk Management Authorities (RMAs) and their partners to develop the programme of interventions mainly from locations where hard engineered solutions to flood risk were unsuitable or insufficient for technical, economic or financial reasons.
November 2016 to March 2017	Expectation that £1m should be set aside for Community Groups.	Development of an open competition for organisations to bid for grant funding.
March 2017 to May 2017	Open competition launched in March and closed in May.	Catchment Partnerships, Environment Agency Area teams work with communities to develop proposals.
May 2017 to July 2017	Competition applications assessed.	Local Environment Agency flood risk and environment programme teams reviewed submission to ensure they were in-line with local plans. The proposals were then assessed by a national panel, before a final decision by the Floods Minister
July 2017	Announcement of allocation of the funding to 58 projects (one subsequently split into 3 to make 60) in the NFM programme.	
August 2017 -	<b>Catchment Programme</b>  Projects develop business cases and prepare to move to works on the ground.  <b>Community Programme</b> Projects develop business cases, and complete paperwork to access the grant before work can begin.	

The competition was originally capped at £1m with each project eligible for a maximum of £50k. However, there were nearly 200 applications so the total funding was increased to £1.6m.

*Figures 2.1* shows the 26 Catchment scale projects will test 102 NFM interventions. This helps ensure the pilot programme will produce some useful results on a range of measures. This pilot programme is expected to enable project teams to be more certain about the outcomes of NFM interventions.

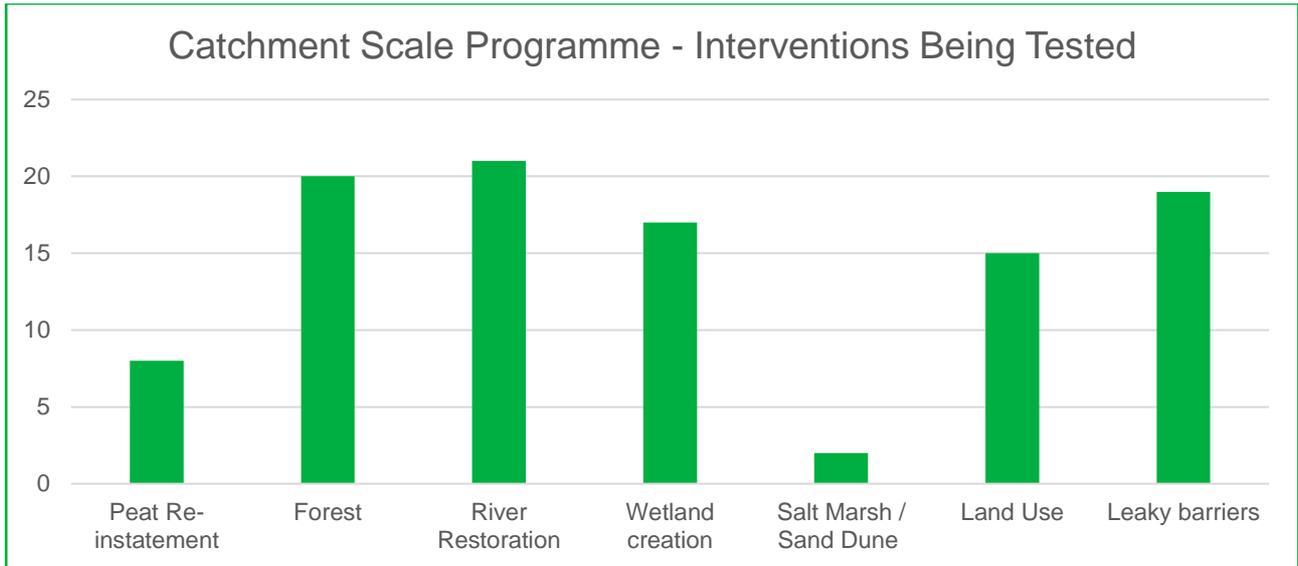


Figure 2.1: Catchment Scale Programme - Interventions being tested

Flood risk interventions are on a spectrum from protecting and restoring natural processes to emulating and managing them. *Figure 2.2* shows this spectrum. An intervention type may generally be seen fitting in one place along this spectrum, however, this may change depending on the location and geography of the catchment. For example, a leaky barrier may be seen as significant natural restoration in a woody area using felled trees, or hard engineering where a wooden bund is engineered with sawn and treated timber.

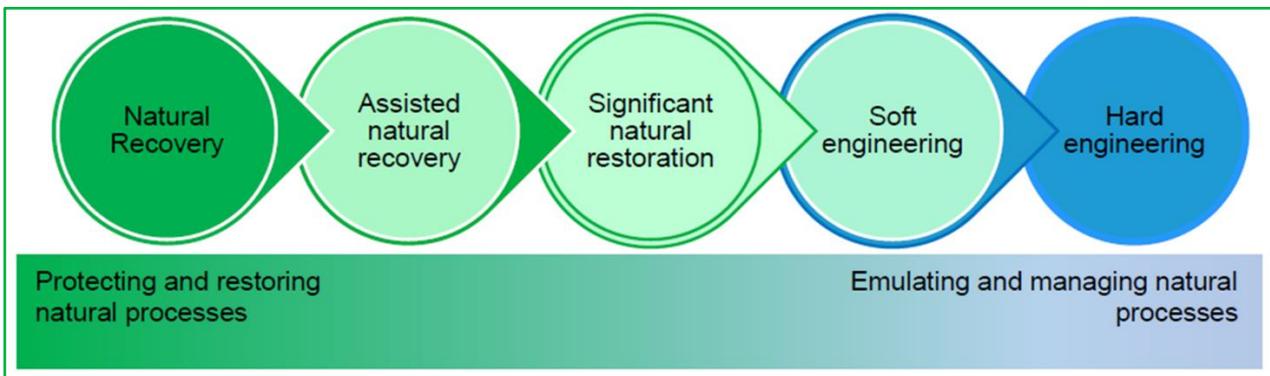


Figure 2.2: Spectrum of Interventions

## Assessment

**Catchment scale programme** - The process of assembling the programme began in summer 2016, before the announcement of £15m funding for the NFM programme. Environment Agency local teams and their partners were asked to propose projects that would test NFM interventions. *Figure 2.3* shows that just under two thirds of responses were confident they understood the application process. However, feedback showed teams would have preferred more time for discussions with local landowners and managers. The third who were less confident may be expected with an innovative programme and iterative approach to assessment.

## PROJECT TEAMS' CONFIDENCE IN THE APPLICATION PROCESS

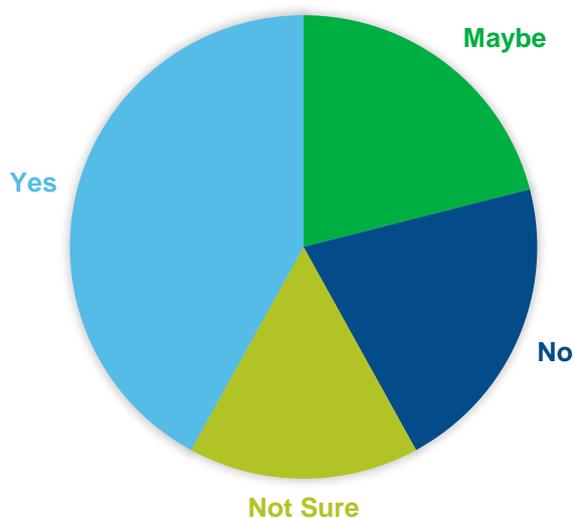


Figure 2.3: Confidence of the application process

The Environment Agency set up a panel of experts to assess the applications. Members of that panel said they felt project teams provided clear justification for the projects. The assessors said that in around half of the cases, they did need to ask for additional information or clarification to be able to make an informed decision. This may reflect the variety of projects proposed and the opportunity for trialling NFM techniques.

**Community scale programme** - 10 of the 34 community projects and 6 members out of 11 on the national panel who assessed the competition provided feedback.

Nearly all of those who applied for funding found it was not difficult to apply for funding through the competition. This is a fantastic result for a competition that was designed, launched and run within only a few months. [Figure 2.4](#) shows that a small proportion found the application difficult to complete. The reliance on Catchment Partnerships (CPs) meant that additional time was needed for community groups to engage with CPs. Both the CPs and Environment Agency Area teams would have liked to have been better informed about their role before the competition was launched.

Those on the national panel who assessed the competition entries provided general feedback about the process. Feedback was positive and included that there was enough time for assessment, despite heavy workloads of the panel members. The process was identified as being well organised which allowed good, mature, discussion.

### Programme Success

The programme has enabled new relationships to be formed and existing ones to be enhanced. An example of this is Flood Risk Projects working with Catchment Partnerships to deliver shared objectives of flood risk reduction and environmental improvements.

The National Panel set up to assess the competition was a great collective effort from a number of organisations, including Department for Environment, Food and Rural Affairs (Defra), Regional Flood and Coastal Committee (RFCC) Chairs, Natural England, Forestry Commission, Rivers Trust, Wildfowl and Wetlands Trust (WWT) and the Environment Agency, and can be convened again to support the programme.

## SIMPLICITY OF THE APPLICATION FORM

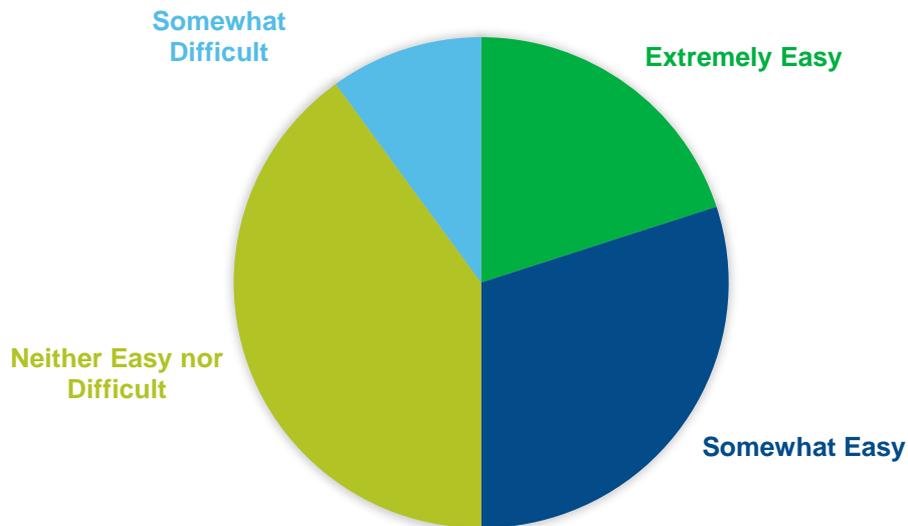


Figure 2.4: How easy did project teams find the application form to complete

The Catchment and Community Programme show a contrast between how easy they found it to apply for funding. This may be in part due to the simpler and quicker process for the community projects. Risk Management Authorities and Environment Agency project teams managing the Catchment scale programme had expectations, which needed to be addressed.

### Twyver Natural Flood Management Project - Gloucestershire

#### Community Programme

NFM Funding:	<b>£80,000</b>
Contributions:	<b>£50,000</b>
Habitats improved or created:	<b>5 ha and 11 km</b>



The project focuses on 8 km<sup>2</sup> of the upper Twyver catchment with the principal aims of reducing flows and attenuating water in the steep upper catchment; and reducing sediment entering the river. Landowner engagement is a key priority for the project, to encourage a range of techniques including instream large woody structures, soil management and woodland planting.

The project has faced a number of challenges including; identifying landowners; managing expectations; getting landowners to buy-in to this project; understanding what the funding can be used for in pursuance of our objectives; and meeting monitoring requirements given the scale/spend of the scheme and lead in time. The majority of issues listed above have been overcome and resolved by early engagement with landowners.

Key lessons include:

- Writing a business case and getting it approved proved difficult and felt slow
- Evidence of the benefits from the work will only be apparent from long term monitoring
- Walking the land together with landowners and communities has proved the most effective way of identifying and agreeing locations and designs for NFM features
- It takes time to engage with people and, when you do, plans change
- Risks about future liabilities and costs of maintenance can be overstated and cause unnecessary worry. In practice, they can be controlled to ensure that they are small.

## Lessons Learnt

1. By supporting projects that had already been partly formed with partner involvement, we were able to allocate most funding, quickly and with confidence.
2. Project teams require clarity of how projects proposals will be assessed before proposals are invited.
3. The steps required before funding can be released were not clear to all partners. Organisations who have limited experience in dealing with public money need additional support to secure funding.
4. The assessment of NFM proposals highlighted a number of common technical issues:
  - a. health and safety requirements, particularly where community groups and volunteers install NFM measures
  - b. insurance needs and clarity on future responsibility for new NFM features
  - c. establishing organisational structure to receive and manage funding
  - d. regulatory requirements (e.g. permits and consents for NFM features)

# 3. Valuing benefits and project assessment

## 3.1 Introduction

The allocation of public funding to a project is not the final stop/go decision point. We have systems in place to ensure the best possibility of successful project completion before funding is released. These systems include assurance reviews and approval arrangements which apply to all projects and programmes, whatever their size or degree of complexity, but in proportion to the level of perceived risk and benefits.

Assurance considers the range of benefits that a project may deliver as well as the costs likely to be incurred during the project and in the future, should there be a need for ongoing maintenance. For the £15m NFM programme, project assurance was carried out by the Environment Agency's Large Project Review Group (LPRG). This assurance panel is responsible for projects which carry the biggest risks, or have a whole life cost of £10m or more. They reviewed the NFM programme as they also have a responsibility for innovation, and NFM falls into that category at the moment. For the projects in the NFM programme LPRG focussed on assessing the capacity of the project to achieve the four objectives of the programme.

Flood and Coastal Erosion Risk Management projects usually use computer models to make an assessment of the likely reduction in flood risks that will be achieved, although simpler techniques can also be used. There are also a range of techniques for assessing other benefits including improvements to the environment. The £15m NFM programme has provided an opportunity to test different ways of estimating flood risk and environmental benefits. It is also appreciated that many of the interventions are planned on headstreams or ordinary watercourses where there is comparatively little water flow or water level data. Many projects will be installing monitoring equipment, or using data from downstream to be able to measure the impacts of the interventions.

## 3.2 Assessment

The Environment Agency developed a bespoke process for assurance of the NFM programme to reflect the uncertainty of the measures. The NFM programme is testing interventions and there is no guarantee interventions will work before they begin. However, an estimate of expected benefits to test was required. This assurance process is proportionate and rooted in established processes used by all EA managed projects, and took a risk based approach to decision making. This assessment also considered how the project achieved the Defra Criteria for funding.

The Catchment Scale projects used a business case template created with guidance specifically for these NFM projects, and amended based on feedback from project teams. It removed the need for some early steps of traditional projects to enable flexibility in measures and their locations to be negotiated with landowners. It also recognised the uncertainty in assessing flood reduction, but required an assessment be carried out and justified. For those projects that weren't able to do this, a method was suggested in order not to overstate benefits. This enabled projects to move to construction more quickly than they otherwise would have.

### Good Practice Sharing

Where projects were not able to justify proportionally high cost computer modelling, or where modelling would have been less reliable, National experts developed a method for project teams to use to estimate flood risk benefits. This was based on analogies with other projects and used data on reduction of risk to properties held within the Partnership Funding Calculator.

This method can be tested for its reliability as the programme develops and projects generate data for assessment.

The Community scale projects used a new 'Simple Business Case' developed for them. This included guidance, and didn't require teams to provide a list of options, knowing that this had already taken place in the allocation process. The process required project teams to set out the resources and plan to deliver the proposal.

### Good Practice Sharing

The simple form business case has been adopted by the assurance services as best practice. It has been updated and is being used where the Environment Agency gives grants to other organisations using the Charities Act. Specifically in the assurance and allocation of Water and Environment Improvement Funding (WEIF).

Project managers gave feedback on the assurance process as *Figure 3.1* shows.

Overall, catchment scale project teams were unsure or didn't think the process was well defined. This may be due to project managers having expectations of the process, and felt less comfortable deviating from the established process. Their feedback influenced updates to the guidance and process.

Generally community projects thought the assurance process was clearly defined. This may be due to the simple nature of the form developed for them which has now been adopted by other funding streams for small grant provision.

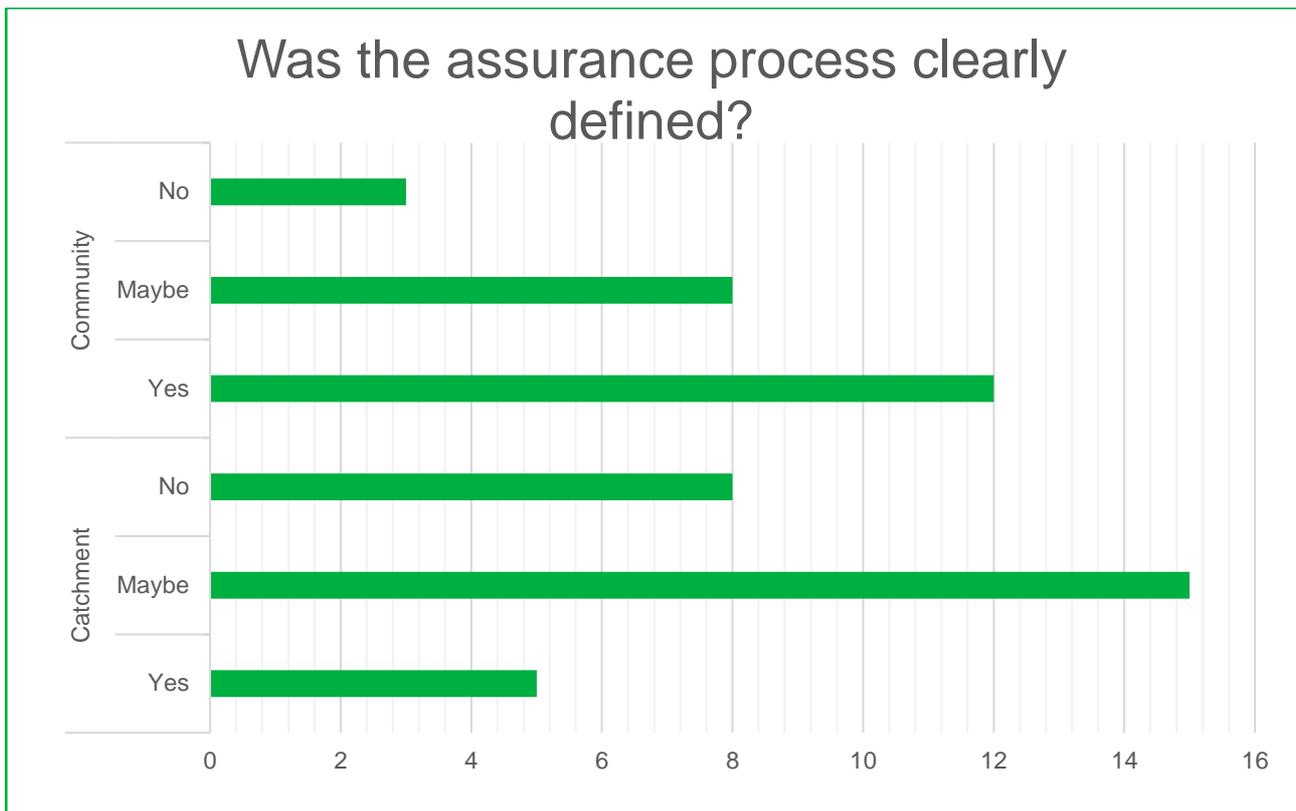


Figure 3.1: Was the assurance process clearly defined

Two of the greatest challenges that project teams faced were demonstrating/valuing benefits of the project and meeting the timescales expected to complete the process. The Community projects also identified securing funding from other sources as an issue for gaining approval. There is some anecdotal evidence that some found it difficult to find the resources up-front to assess benefits and costs to enable them to be in a position to secure the FCERM GiA.

### 3.2.1 Demonstrating and valuing benefits

Demonstrating and valuing the benefits was the main issue project teams had to overcome in passing the assurance phase and securing approval for funding. Generally FCERM projects are required to demonstrate reduction in risk using specified "Outcome Measures" (OMs) which generates the amount of GiA they can claim. The NFM projects made estimates of households expected to benefit from reduced risk, but the confidence that the interventions will deliver a large risk reduction are low at this stage in the programme. No claims of "households better protected" from flood risk are being made at this stage given the experimental nature of the programme.

#### Modelling

Projects were asked about any computer modelling used, specifically for understanding flood risk benefits. Catchment scale projects found it difficult to tell if modelling was required or whether other assessments would be sufficient to provide an estimate of likely flood risk reduction. Community projects found it easier, generally deciding that modelling studies were not suitable for smaller scale, and less complex projects.

Around two thirds of the catchment scale projects responding to the survey said they will use modelling, with the remaining third using other data and information, such as the 'Potential Maps' which are part of the Evidence Directory. Over half used or expected to use the modelling to support the development of the business case, with a further third using modelling to produce data and maps for other uses.

There were some indications that modelling was not just used for the flood benefits, but included assessments of habitats, local environments, water resources, and water quality. Projects noted that they did, on the whole require technical support to run models.

## **Monitoring**

Many of the projects are in the later stages of planning, or early delivery and haven't had the time to have appropriate monitoring. That is compounded by the relatively dry period we have experienced since the programme began. This section focuses on how project teams are approaching monitoring, to understand how the interventions work in the landscape, and the difference they make.

All projects have developed a monitoring plan and are using a variety of approaches to measure changes in river flows and environmental health to assess the effectiveness of NFM, and to understand the impacts, outcomes and benefits. Some specifically refer to informing future projects, engaging stakeholder or partners and contributing to the evidence base for NFM.

More than 70% of the projects have stated that monitoring will be effective in understanding the way in which NFM can be delivered. The uncertainty derives from the relatively short timescale until reporting, between now and 2021, with regard to comparison both of sufficient baseline and post-installation performance in heavy rain. We risk only capturing the period of environmental adjustment immediately post construction, which may not reflect the operating capabilities at maturity. Others note that expecting short-term monitoring to provide proof of effectiveness is unrealistic.

## **Data assessment**

When works are complete, data from these programmes will begin to emerge and can help calibrate models and build confidence in other techniques for estimating the expected benefits of future NFM projects. This will be partially dependent upon whether measured outcomes are being compared to modelled predicted outcomes, control areas without the interventions, or pre and post implementation data collection. Academic studies funded from other sources are also underway.

## **Benefits assessment (not flood risk)**

After flood risk, the assessment of the responses shows that the benefits most commonly quantified and monetised are habitat improvement/creation and biodiversity. Although many respondents identified benefits like amenity, sustainability (including climate change mitigation) and research as likely to result from their project, these types of benefits are typically much harder to quantify and, therefore, quote a financial value.

The level of quantification of potential benefits is quite low, with an average percentage of only 4% of benefits being ascribed a financial value across the benefit categories. Potential reasons for this include lack of access to tools/guidance and the evidence needed to do this. However, project teams were keen to use benefit evaluation tools such as Ecosystem Services Assessments for these broader benefits.

### **Programme Success**

Project teams have been given support to assess and value non flood risk benefits through Ecosystem Services approach including 'Appraisal Summary Tables'. For the community programme this has enabled community groups and charities to value the work, and in some cases quantify the benefits in financial terms. This will enable others to do that in the future should they wish to. It also enables projects to consider wider funding sources for the shared benefits.

## Shipston-on-Stour Project - Warwickshire

### Catchment Programme



NFM Funding: **£150,000**

Contributions: **£68,000**

Habitats improved or created:

**10 ha and 22 km**

Shipston-on-Stour remains vulnerable to flooding. The risks are compounded by surface water run-off from rural land above, as well as from developed areas within and urban extensions of the town. The area has experienced flooding in 1998, 2007 and had near misses in 2012, 2013 and 2016 with approximately 85 properties at risk. A traditional engineered project would be high cost, therefore this project will install more than 350 interventions and monitor performance both for flood risk and habitat and biodiversity improvements.

Key lessons include:

- It is critically important that a monitoring network is continually assessed to gather more evidence of NFM over time and to different events.
- Project Officers must really be managers, able to make complex decisions about particular schemes, and demonstrate their knowledge/level of responsibility to the landowner or farmer to gain trust. Ensure you have a detailed understanding of farming practices and management methods.
- Use community monitoring (local residents and farmers) to ensure the local partners are invested and informed about the schemes, which can also inform maintenance and adaptive management considerations.
- It was important to ensure farmers/landowners took ownership of structures on completion and agree to maintain 'as-built'.

**3.2.2 Timescales** were identified as a challenge for project teams. Assessing the qualitative responses, these fell into two areas.

1. The timescales were challenging for projects to be assured and business cases completed enabling work to begin as soon as possible. Some project teams reported that this didn't allow enough time for thorough landowner engagement or to plan monitoring arrangements to demonstrate impact of works. However, we know that landowner agreements can be finalised after the business case is approved provided evidence of in-principle support is sufficient.
2. Fixing delivery milestones as part of the allocation brings risks as very few of the details have been agreed.

One response said that an improvement would be to have all the steps in the process spelled out in detail before it began.

In practice, guidance and processes were developed as projects progressed, using their feedback. In particular, the community scale programme was based on a one-off grant process with bespoke objectives and required adapting existing processes to enable project teams to demonstrate benefits and enable projects to be evaluated suitably before grant is released. These arrangements have taken some time to develop, communicate and refine to be effective.

The evidence shows that there is no single, consistent way to assess and evaluate the benefits both in terms of method and expertise. This presents some risks to both value for money, effectiveness and sustainability of the intervention(s). Linked to this is the challenge for funding monitoring costs longer term to validate the evidence and improve the library of evidence on the effectiveness of a range of NFM interventions and landscape settings.

## **Lessons Learnt**

1. Project teams found it difficult to produce evidence of the benefits proposed as part of their business cases for NFM investment. Teams would like further information and expertise in how to assess and value the benefits (flood risk reduction and ecosystem services) and costs of NFM work.
2. Project teams were required to commit to particular NFM interventions and timetable before establishing designs, costs and partnership support. NFM projects need to be adaptable in their approach, and should not be seen as fixed before practicalities have been agreed with local people.
3. Conventional approaches to modelling the benefit of investment in flood risk reduction are often disproportionately expensive for NFM schemes.
4. Suitable modelling or other evidence must be used to support any claim that households are better protected as a result of the interventions. In these cases there should be sufficient confidence in the effectiveness of interventions to revise the probability of flooding shown on the Environment Agency's flood map.
5. More information and advice on suitable approaches to monitor the benefits of NFM work and record results will help support a dependable assessment of the effectiveness of the interventions that have been put in place.

# 4. Partnership working

## Introduction

One of the objectives (Defra Criteria) of the NFM programme is to promote partnership working. This section considers how partnerships have been established and with what parties.

## Assessment

### Payment of funding

Community projects were able to access funding via one of two methods. Risk Management Authorities could use existing mechanisms under the Floods and Water Management Act. Third sector and community groups needed to be paid as partnership grants supported by the Charities Act to ensure proper use of public funds. This was the first time the FCERM GiA was paid via this route and required a delegation of powers from Defra. This enabled these groups to be paid using the partnership grants mechanism.

### Floods and Water Management Act

Risk Management Authorities generally have the resource and expertise to prepare business cases and complete paperwork in order to access the funding. There was some confusion where some RMAs tried to use the Partnership Grant route, but this was soon resolved.

### Partnership Grants supported by Charities Act

Feedback from the organisations using the partnership grants mechanisms was mixed. Around a third of projects were dissatisfied with their experience. Reasons behind this include the amount of time it took for grant agreements to be agreed. Partnership Grants follow a thorough process to make sure public money is spent appropriately and ensure clarity of responsibilities. This required significant resource to manage and meant that some project teams had to make several revisions to their project proposals before they were agreed.

Feedback on the payment process identified that:

- Established environmental non-governmental organisations (eNGOs) have varied resources but are generally able to produce business cases and, with support, provide the necessary paperwork to gain approval to access their grants. In some cases, support is received via the Catchment Based Approach (CaBA) National Support Group. Many of the 23 eNGOs, leading a community project, are a part of the CaBA approach and can access their support.
- Smaller local community groups, may have limited or no experience in managing public grants and need support in order to do so. Three organisations were initially ineligible for grant due to their organisational status. To overcome this, two have partnered with an established charity who manage the funding for the project. The other has set up as a Community Interest Company (CIC), resulting in an additional need for them to gain appropriate insurance (liability insurance), an unexpected cost to the project.

## Other funding sources

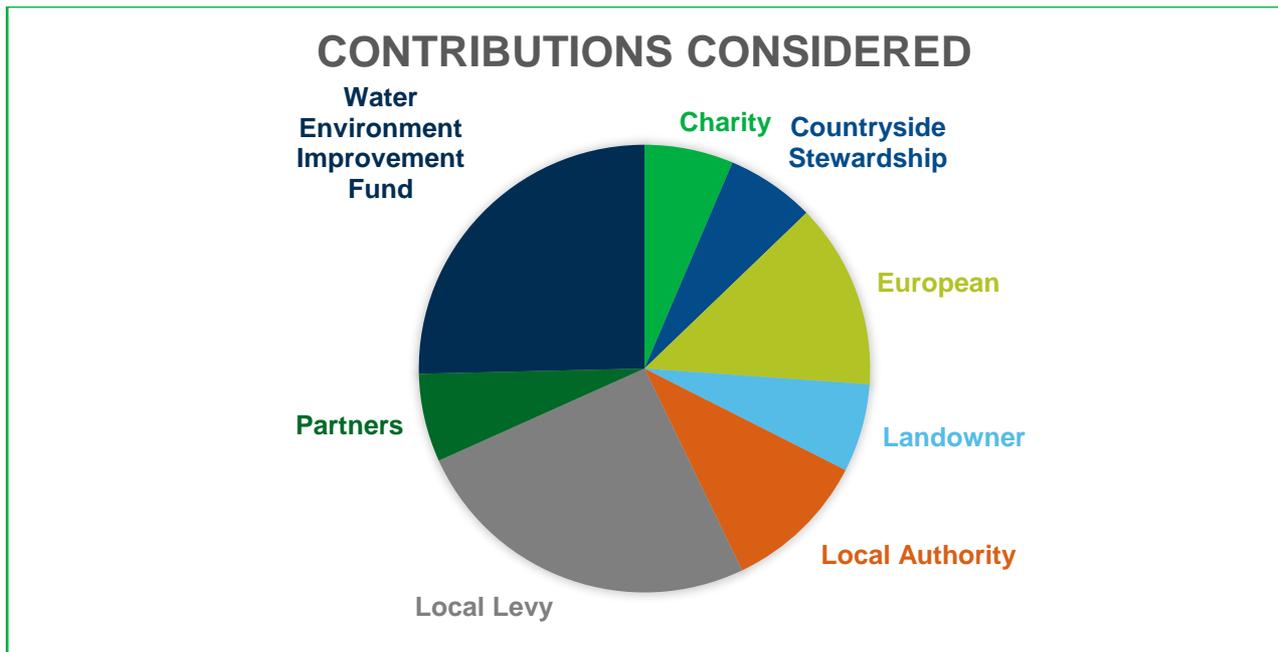


Figure 4.1: Proportion of funding sources complementing the NFM Funding

Over two thirds of the projects who responded are considering applying for further funding for their project from other sources since receiving the award from the NFM Programme or have already done so. *Figure 4.1* shows that two thirds of sources being considered are public funds, these include Countryside Stewardship, Local Authority, Local Levy and the Environment Agency administered Water Environment Improvement Fund (WEIF).

The priorities of many of the external organisations managing projects in the programme are often environmental improvements (e.g. habitat improvement and increasing biodiversity) rather than managing flood risk. It is a fantastic benefit of the NFM programme that it's been able to work with organisations such as these to reduce flood risk as well as improve the environment. These organisations may also have access to funding that projects with flood risk benefits may not have otherwise been able to use.

The NFM programme has attracted more than 85 partners to support the delivery of the projects. *Figure 4.2* shows there are huge variety of partners working on the projects, which will help deliver better outcomes. Around two thirds are government organisation, with the remaining third being made of local and national organisations including charities (e.g. rivers trusts, wildlife trusts, and RSPB).

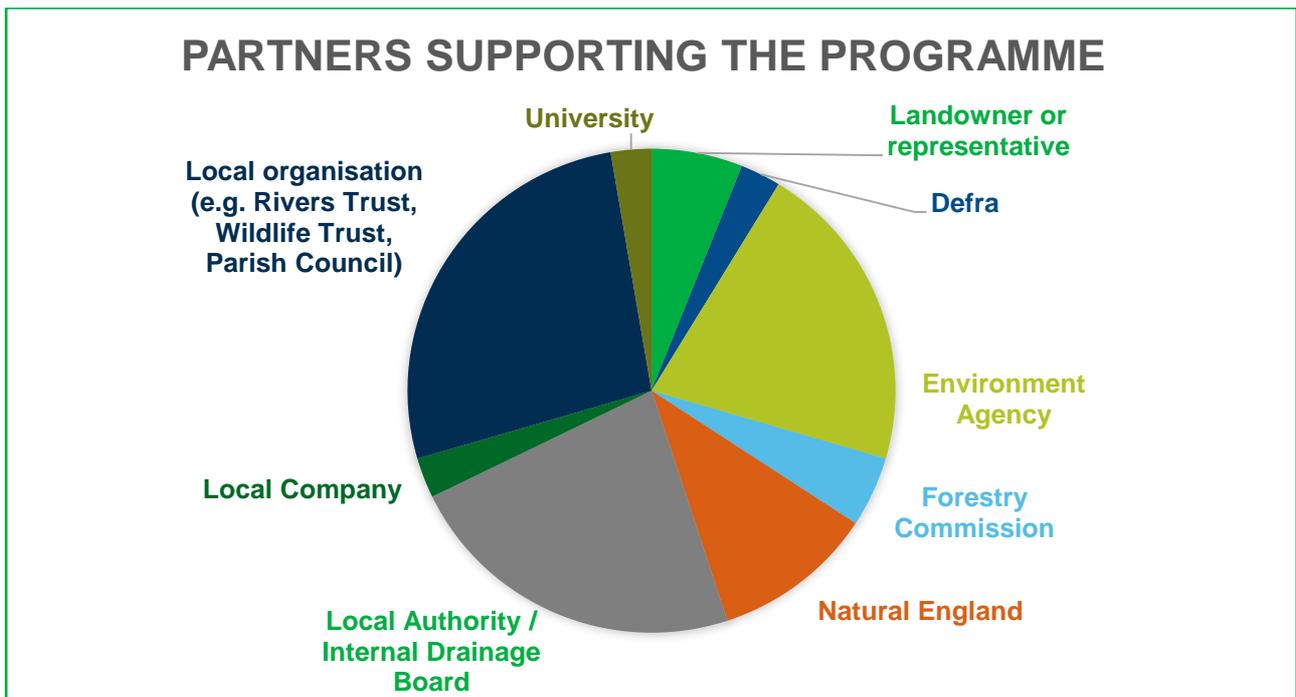


Figure 4.2: Proportion of partners supporting the NFM Programme

### Engagement

As projects start to develop, engagement is key. At this stage, all projects have done some engagement, with landowners and local organisations being the most commonly engaged. Businesses were identified as a group that was more difficult to engage with.

When asked why projects were looking to engage with others, the most common reason was the need to raise awareness and ask for support for the project. In the case of NFM projects it is particularly important to promote the project and generate support from partners, the community and other stakeholders. This is because NFM features are often located away from the main river network where any work is only possible with the consent and support of local people rather than use by risk management authorities of legal powers to act.

The community programme highlighted that the lack of resource in the partner organisations has sometimes led to delays in projects:

*'We are relying on partners to design features, and although aware of the need for rapid progress, it is hard to force them to work at speed.'*

However, just under half of projects have been able to start a new partnership since receiving the funding with around the same number being able to continue with an existing partnership which would have otherwise folded.

### Engagement Challenges

A lack of understanding about NFM, concerns around maintenance and liability (see section 5) and limited funding were all challenges identified when it comes to engagement. Challenges have most commonly been overcome by having face to face meetings and using evidence and data to demonstrate the benefits of NFM. Face to face meetings are particularly time consuming, demonstrating that there is a need for investment in engagement to gain buy-in. Projects have identified that having a proven knowledge and understanding of the situation also helps to build trust. Some have found that by working with a well-established organisation or project, such as 'Catchment Sensitive Farming (CSF)' they have more success when working with landowners.

As projects develop, more visual methods of communication are being used, such as video and drone footage as these have been found to work well as engagement tools.

## The Evenlode Project - Oxfordshire

### Catchment Programme

NFM Funding: **£50,000**

Contributions: **£590,000**

Habitats improved or created: **2 ha and 3 km**



The Littlestock Brook is a 16km<sup>2</sup> tributary catchment of the Evenlode. The project will assess the effectiveness of using natural river processes, land management and soft engineering approaches to reduce the risk of flooding and improve water quality and biodiversity.

In 2017 Milton Parish Council funded £5,000 towards 12 woody dams (as bed check weirs to reduce channel incision) and negotiated a 500m riparian woodland strip to be planted. The project has seven partner organisations who are implementing NFM measures.

Key lessons:

- a project which requires land management changes at a catchment scale, must have ‘time’ to build relationships to:
  - bring the experts and data together to identify the best locations to make these multiple interventions to slow and store surface run-off.
  - engage with the rural communities affected by flooding and to understand where their observations tie into the data.
  - work with the numerous landowners to decide what changes would work with their businesses and grant schemes.
  - liaise with local contractors and landowners to use as little project resource as possible in delivering these changes.
  - monitor effectiveness and share the findings back to the community and wider.

## Lessons Learnt

1. There is a clear need for investment of both time and funding in engagement as it is crucial to gaining support from landowners, and to forming and sustaining partnerships needed for NFM.
2. Many projects rely on their partners to deliver aspects of their project, particularly landowner engagement. This brings the benefit of reaching local people effectively but can come with reduced central control on delivery timescales.
3. An organisation that does not have flood risk reduction as one of its organisational priorities may still have the ability to implement NFM. An amount of funding can often encourage organisations to seek out additional funds and deliver NFM and other benefits.

# 5. Responsibilities and maintenance

## Introduction

Each of the 60 projects in the NFM programme has considered the whole-life of the interventions. In considering a time frame beyond installation work (typically 15 to 20 years or longer) there is naturally some uncertainty. The issues and uncertainties identified have included questions about intervention/asset ownership, who is responsible if things go wrong, who should maintain NFM features and who should pay for them. In some cases, farmers and other land managers are able to make use of countryside stewardship funding to help fund any future maintenance or compensate for any lost income. EU Exit has raised questions about future land management funding sources. Some projects have found that landowners are concerned that decisions they make now may impact their funding in any future land management funding arrangements.

Responsibilities for structures or natural features generally lie with the owners of the land where they are situated. Hence, NFM measures installed will usually belong to, and be the responsibility of, the landowner once installation is complete. Landowners can make arrangements for someone else to maintain structures on their land and features that provide benefit to others may in some circumstances attract funding for maintenance. This chapter looks at the lessons raised by the project teams with suggestions on how issues can be overcome.

## Assessment

Project teams had raised issues around managing future risks (particularly costs of future maintenance and possible exposure legal liabilities) before being canvassed for this report. The Environment Agency produced a 'Minimising the Risks' document in summer 2018 in response to this challenge. This is a quick guide aimed initially at Environment Agency staff but available to others to help understand potential risks and liabilities when working with natural processes to reduce flood and coastal erosion risk. The results of the survey show that at the moment there is an overall lack of familiarity of this document and an appetite for more guidance and support on this issue.

### Good Practice Sharing

'Minimising the Risks' document has been published for NFM projects. This sets out a series of questions for teams to consider as part of their assessment of risk of the NFM interventions. They may not be able to remove a risk entirely, but they can have a plan to reduce it.

One of the most significant concerns raised by project teams was their uncertainty about future funding for maintenance of NFM features. Given low confidence in securing future funding for maintenance, project teams are sometimes unclear how to minimise liabilities so landowners and other partners can be confident enough to proceed. *Figure 5.1* shows there isn't a consensus of who should own or maintain the NFM interventions. This may reflect the broad range of interventions. Around a third of the responses from the Project Teams agreed that the landowner should own/maintain the interventions in the future. This may be a view held by community groups who have no funding beyond construction to inspect and maintain the interventions. It is essential that each project reaches an agreement with the landowners and partners before construction begins.

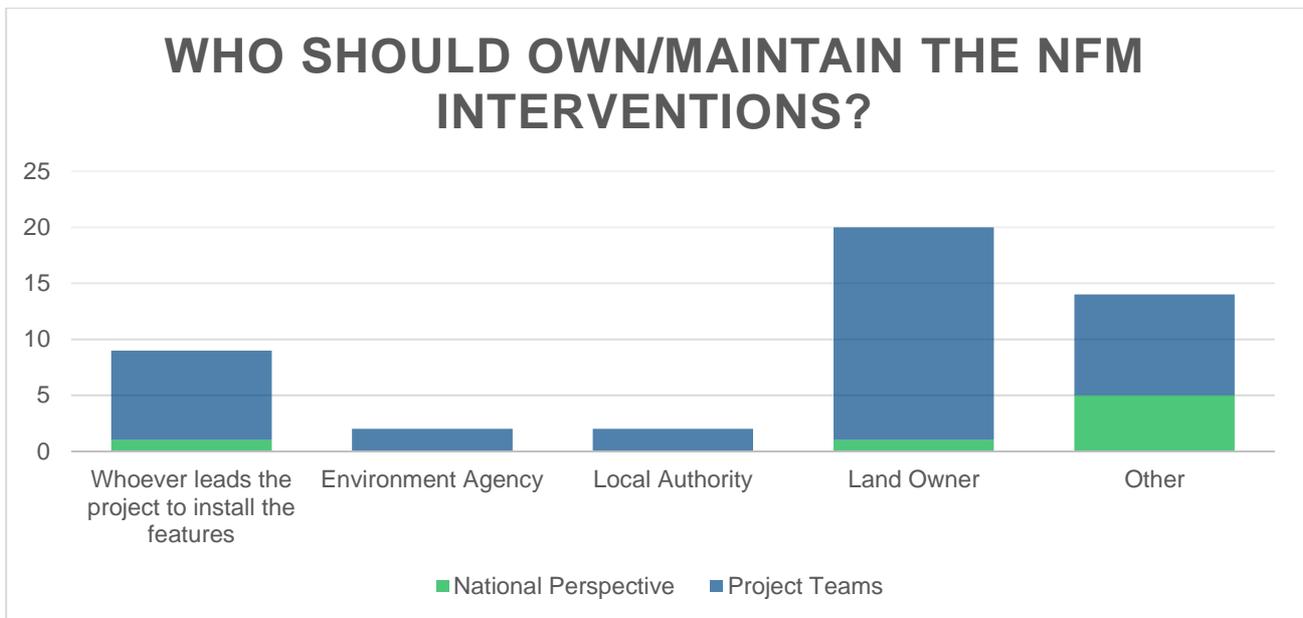


Figure 5.1: Who NFM project teams think should own and maintain NFM interventions once installed

The majority of projects have included a plan for or are considering a plan for maintenance. Most of the respondents from a national perspective don't think that a detailed maintenance (or replacement/ removal) plan is required in every case – it has been suggested that it should be based on the risk of failure of the interventions. For example, if not properly designed or located, leaky structures in watercourses intended to hold back water and reduce flood risk may bring some risk that material could be washed away and cause blockages or damage elsewhere. On the other hand, changes in land management practices such as farming methods are unlikely to bring similar risks.

Reduction of this risk can be achieved through consenting and/or inspections. The Environment Agency is the consenting authority for work on or adjacent to Main Rivers. Work may also require Planning Consent from the Local Authorities who are also responsible for Ordinary Watercourses.

### Good Practice Sharing

Work is in progress between the Environment Agency, Forestry commission and Local Authorities supported by the ADEPT group of Local Authority Officers to make consenting for Ordinary Watercourses more consistent across England. This work promotes a consistent assessment of works and payment for those requesting permission to build NFM interventions.

This work will also benefit other flood risk works promoted by communities and landowners in the future.

Visual inspection of NFM measures after they have been installed to check for damage and assess any need for maintenance will also reduce risk of failure. Those that responded from the project teams felt that inspection of the interventions should be once or more per year. However there are numerous ways that projects intend to do this as well as how long they plan to do it for; and a recognition that different measures and locations will bring different inspection and maintenance requirements.

## Lessons Learnt

1. Engaging with landowners and managers to agree details of NFM works and clarify responsibilities is critical. Designs and timings can change as a result.
2. Responsibility for maintenance and response to any failure of NFM measures needs to be agreed and accepted before interventions are installed. The approach to maintenance will vary according to the risks.
3. The project team should carry out a risk assessment before installing NFM features (generally part of consenting (lesson 4)) to help limit potential for unintended harm. If a risk assessment indicates that a particular type of damage is possible, consideration should be given to how to reduce that risk. This may involve altering design characteristics or siting of NFM measures to minimise risks.
4. Consenting of NFM interventions should follow a consistent set of principles across the relevant authorities and charge those doing the work in fairly.

## 6. Summary of lessons and actions

This section lists out the lessons from each of the section, and where relevant highlights an action to embed this within the programme. These will be added to the NFM Action Plan, which is overseen by the NFM Steering Group. This group is led by the Environment Agency, but includes Defra, Natural England and Forestry Commission.

Some lessons support subsequent programmes in their development, and these will be shared with the relevant teams.

Lesson	Section	Lesson	Action
<b>Lesson 1</b>	Develop a Programme	By supporting projects that had already been partly formed with partner involvement, we were able to allocate most funding, quickly and with confidence.	Ensure projects have an outline plan agreed and partner support, before allocating them funding.
<b>Lesson 2</b>	Develop a Programme	Project teams require clarity of how projects proposals will be assessed before proposals are invited.	Further improve instructions for project teams to help them understand how projects will be assessed and prioritised.
<b>Lesson 3</b>	Develop a Programme	The steps required before funding can be released were not clear to all partners. Organisations who have limited experience in dealing with public money need additional support to secure funding	If grants are repeated, develop support arrangements for organisations who have limited experience in dealing with public money.
<b>Lesson 4</b>	Develop a Programme	The assessment of NFM proposals highlighted a number of common technical issues	
		– health and safety requirements, particularly where community groups and volunteers install NFM measures	Organisations receiving funding should have appropriate H&S plans and insurance in place to carry out works.
		– insurance needs and clarity on future responsibility for new NFM features	Organisations receiving funding should assess risks and have insurance in place for any failure of works carried out.
		– establishing organisational structure to receive and manage funding	Organisations receiving funding must have appropriate organisational structure in place with authority delegated to members of the organisation to receive and manage funding.

		– regulatory requirements (e.g. permits and consents for NFM features)	Organisations carrying out works must have appropriate consents and permits in place before installing interventions.
<b>Lesson 5</b>	Valuing benefits and project assessment	Project teams found it difficult to produce evidence of the benefits proposed as part of their business cases for NFM investment. Teams would like further information and expertise in how to assess and value the benefits (flood risk reduction and ecosystem services) and costs of NFM work.	As NFM approaches are used more often, more mature industry standard guidance and knowledge (building on "Working with Natural Processes Evidence Directory") will help to:  Estimate expected costs, benefits and outcomes  Show how risks and future maintenance will be managed.
<b>Lesson 6</b>	Valuing benefits and project assessment	Project teams were required to commit to particular NFM interventions and timetable before establishing designs, costs and partnership support. NFM projects need to be adaptable in their approach, and should not be seen as fixed before practicalities have been agreed with local people.	Give project teams enough flexibility to work with partners to agree designs and costs and have an approved business case before fixing the details of a timetable for delivery.
<b>Lesson 7</b>	Valuing benefits and project assessment	Conventional approaches to modelling the benefit of investment in flood risk reduction are often disproportionately expensive for NFM schemes.	Develop industry standard guidance to assess NFM interventions to at a reasonable cost.
<b>Lesson 8</b>	Valuing benefits and project assessment	Suitable modelling or other evidence must be used to support any claim that households are better protected as a result of the interventions. In these cases there should be sufficient confidence in the effectiveness of interventions to revise the probability of flooding shown on the Environment Agency's flood map.	Review models and data as part of assurance of projects to develop confidence that interventions provide enough risk reduction to change the Environment Agency's flood map.
<b>Lesson 9</b>	Valuing benefits and project assessment	More information and advice on suitable approaches to monitor the benefits of NFM work and record results will help support a dependable assessment of the effectiveness of the interventions that have been put in place.	Monitoring guidance has been developed, and an interim data collection platform built, but this must be embedded in NFM projects and ways of working.
<b>Lesson 10</b>	Partnership working	There is a clear need for investment of both time and funding in engagement as it is crucial to gaining support from landowners, and to forming and sustaining partnerships needed for NFM.	Encourage project teams to develop a realistic time frame for building and sustaining relationships with partners.

<b>Lesson 11</b>	Partnership working	Many projects rely on their partners to deliver aspects of their project, particularly landowner engagement. This brings the benefit of reaching local people effectively but can come with reduced central control on delivery timescales.	Use partnerships to engage with landowner and the community and ensure any contractual relationship is clear about expected timescales.
<b>Lesson 12</b>	Partnership working	An organisation that does not have flood risk reduction as one of its organisational priorities may still have the ability to implement NFM. An amount of funding can often encourage organisations to seek out additional funds and deliver NFM and other benefits.	Encourage any organisation that can deliver flood risk management activities to be a partner in the programme or in other FCERM work where they can add value.
<b>Lesson 13</b>	Responsibility and maintenance	Engaging with landowners and managers to agree details of NFM works and clarify responsibilities is critical. Designs and timings can change as a result.	Development of future land management arrangements following the UK's exit from EU to include suitable funding for flood risk.
<b>Lesson 14</b>	Responsibility and maintenance	Responsibility for maintenance and response to any failure of NFM measures needs to be agreed and accepted before interventions are installed. The approach to maintenance will vary according to the risks.	Managing the risk guidance should include a framework to decide and agree whom is responsible for intervention failure.
<b>Lesson 15</b>	Responsibility and maintenance	The project team should carry out a risk assessment before installing NFM features (generally part of consenting (action 16)) to help limit potential for unintended harm. If a risk assessment indicates that a particular type of damage is possible, consideration should be given to how to reduce that risk. This may involve altering design characteristics or siting of NFM measures to minimise risks.	"Minimising the Risk" guidance has been published, but should be supplemented to include a structured approach to risk assessment of NFM interventions available more widely.
<b>Lesson 16</b>	Responsibility and maintenance	Consenting of NFM interventions should follow a consistent set of principles across the relevant authorities and charge those doing the work in fairly.	Working with Risk Management Authorities to provide a consistent approach to consenting. This work has been started with the ADEPT group.

It is expected that as the projects develop and more is learnt about the NFM interventions, a further interim lessons learnt report will be issued in autumn 2020. This will focus on the delivery of the interventions and where possible, how effective they have been.

We plan to update the "Working with Natural Processes Evidence Directory" from 2021 when this NFM programme is complete and further evidence from other academic studies becomes available.

# Annex 1

## **Natural flood management funding criteria, published as funding bids were invited.**

We are considering funding a number of natural flood management schemes based on the criteria below. All proposals must be able demonstrate:

1. the scheme will help alleviate flooding<sup>3</sup>;
2. consistency with an agreed or developing catchment plan;
3. how the project will provide additional, quantifiable benefits in line with wider environmental objectives of Defra's 25 Year Plan; (for example for water quality, wildlife, or carbon sequestration, but not limited to these things);
4. how the project enhances the evidence base of natural flood management schemes;
5. how the project will use up-to-date modelling and data tools to deliver its work;
6. how the project will build on investments from within the Defra group and draw in investment from external partners in each area to deliver value for money for the spend across Defra's objectives;
7. that the authority or partners promoting the scheme can secure the measures for which they are requesting funding. (This is likely to involve gaining the agreement and cooperation of landowners and the consent of any relevant authorities); and
8. schemes must undertake to collect and openly publish data, monitor and report on the impact of the work undertaken on reducing flood risk and any other benefits in order to identify.

Bids must be supported by a business case which explains

- the strategic catchment context of the proposal,
- the wider economic value and added environmental benefits of the work to be undertaken (not just in terms of reduced flood risk),
- the financial arrangements to pay for the work (assuming funding may come from a variety of sources),
- the governance arrangements for the scheme. This should also include both initial change project and subsequent maintenance arrangements.

Any projects funded will be required to publish results, share learning and skills developed during the development of the work based on local partnerships and a commitment to improve the environment in line with the 25 Year Environment Plan.

Business cases will be considered in the round but selection of preferred schemes will focus on:

- the level of flood risk reduction expected with preference likely to be given to schemes which would have the greatest impacts in areas currently at high risk,
- the value of the overall benefits for example for water quality, wildlife, or carbon sequestration (but not limited to these things)
- the variety of measures and geographical spread

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<sup>3</sup> Because this scheme is also a learning exercise the weight of evidence required will not be as great as in other cases of grant in aid for flood management schemes but there must still be a sound basis for believing

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