Sussex Flow Initiative

Natural Flood Management Project

End of Year Report

2017/18

Summary

The Sussex Flow Initiative (SFI) is a Natural Flood Management (NFM) project focused on the River Ouse catchment in East Sussex. The project began in 2012 and is the result of a collaboration between the Sussex Wildlife Trust, the Woodland Trust, and the Environment Agency. This report highlights the project's achievements in terms of NFM demonstration and advocacy during 2017-2018.

By working closely with landowners, local communities, and local authorities, the Sussex Flow Initiative has delivered NFM throughout the Ouse catchment, directly influencing approximately 507 hectares of land, and providing advice to landowners of 1903 hectares of land. The NFM techniques that have been utilised include tree planting (with over 17,900 trees being planted in 2017/18 in the form of 2.97 km of hedgerow and 1.77 ha of woodland), 47 natural woody structures installed in streams, as well as the creation/restoration of 4500m^2 of temporary flood water storage and wildlife habitat. The additional water storage created by this work is estimated to be between 398,200 L and 1,398,200 L per flood event, and once mature, the hedgerow are estimated to help slow and store > 5,400,000 L of water during rainy periods. The woodland and hedgerow planting are also estimated to sequester up to 8,800 tonnes of CO_2. The Sussex Flow Initiative has contributed 11.55 hectares to Environment Agency targets for the restoration/creation of priority habitat, and has also provided advice to riparian landowners alongside > 7.5 km of river/stream failing to meet Water Framework Directive (WFD) targets for phosphorous. Furthermore, the Sussex Flow Initiative's NFM delivery has taken place upstream of 16 properties considered by the Environment Agency to be at 'very significant risk' of flooding.

In addition to the delivery of NFM, SFI helps others to use and understand the approach, by sharing case studies, knowledge and experiences with other organisations considering NFM. By utilising best practice and disseminating our findings using a wide range of media, we try to positively influence the uptake of NFM throughout England and further afield. Through a combination of print (e.g. 'Wildlife' Sussex Wildlife Trust's magazine) broadcast (BBC Sussex radio interview), and digital (websites, blogs, Twitter, YouTube, Facebook) media, our message has potentially reached audiences of > 200,000 people.

Following the launch of the Environment Agency's national programme of NFM in 2017, entitled 'Working with Natural Processes', there is a new impetus to deliver NFM as a priority throughout England. The Sussex Flow Initiative will continue to deliver ambitious targets and to build new partnerships with organisations and local authorities with the shared goal of increasing the resilience of local communities to flooding.

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Introduction and project background

In 2012, the Sussex Wildlife Trust, the Environment Agency and the Woodland Trust began an innovative project on the River Ouse in East Sussex, called the Sussex Flow Initiative (SFI). The project aims to investigate ways that catchment-wide Natural Flood Management can help to reduce and delay flood peaks in areas vulnerable to flooding, whilst increasing biodiversity and providing multiple benefits at a landscape scale.

The Sussex Flow Initiative helps to develop new approaches to Natural Flood Management (NFM) across the 672 km² area and 1220 km of river in the Ouse catchment, and makes recommendations on how and where to target them. We are a pilot project to gauge the potential benefits of a wide range of NFM techniques in lowland UK rivers, delivering NFM measures in partnership with communities and landowners. We aim to demonstrate a best practice approach to NFM that can be followed by other organisations beginning to embrace the approach.

One of the key targets of SFI is to promote and integrate a holistic approach to water and land management across the catchment, and to make the catchment more resilient to flooding and drought, through a combination of demonstration and advocacy. Although the effects of NFM such as tree planting can take time to show their benefits, multiple actions taken now can provide positive natural capital benefits in the long term. We hope to inform people about the natural capital benefits of NFM, so that society can make the best choices for present and future generations.

This report provides a summary of the achievements of the SFI project over the last year (2017-2018). We hope that the information helps to provide further evidence of the opportunities for future work in lowland Natural Flood Management.

Project achievements 2017 – 2018

The Sussex Flow Initiative provides working examples of NFM techniques and best practice Natural Flood Management demonstration projects. We promote a landscape scale approach to reducing flood risk and water shortages, and to promoting the wider uptake of NFM in other suitable catchments.

Demonstration

Over the past year SFI has demonstrated a range of NFM techniques, providing case studies and working examples of how NFM can be applied throughout lowland catchments. These projects contribute to the evidence base for NFM techniques, including:

- Planting of woodland and hedgerow, including across slopes and on floodplains
- Restoring and reconnecting river channels, meanders and floodplain washlands
- Providing advice on land use and controlling excessive run-off and erosion
- De-gripping (reversing drainage) of heathland, woodland and other land
- Using and managing woody material in watercourses to slow down flood flows
- Increasing surface water storage (e.g. offline ponds)
- Using leaky dams and barriers to intercept flood run-off
- Promoting swales, permeable surfaces and rain gardens to capture and store run off

Woodlands and hedgerows

Woodland and hedgerow planting formed a large part of our NFM delivery in 2017/18. We have used trees and hedgerows to slow and intercept the flow of water across hill sides and floodplains, and to encourage greater infiltration and percolation of water into soils and groundwater.

In the last year we have planted 17,906 native trees and hedgerow plants across six sites in the form of 2.97 km of new hedgerow[1] and 1.77 hectares of woodland, including 1.80 km of cross-slope hedgerows on slopes adjacent to the River Uck (a sub-catchment of the River Ouse), 0.15 hectares of floodplain woodland, and 140 rare black poplars.

Figure 1. Cross-slope hedgerow planting

[1] Or over 9 hectares if counted as woodland at 2.5m spacing.

Flood storage ponds

Both permanent and temporary ponds can be of huge benefit for Natural Flood Management. In particular, temporary ponds and scrapes, which fill during flood events but slowly drain and empty in the following days/weeks/months, can help to provide maximum flood water storage at exactly the times when it is needed. Temporary ponds are also an important habitat for a variety of aquatic invertebrates, amphibians, and other wildlife.

In the past year we have:

- Created over 30 'pocket ponds' by digging out turves on heathland and using them to block drainage grips, providing important wetland habitat for invertebrates and amphibians, as well as around 1200 litres of additional water storage
- Collaborated with East Sussex County Council and Freshwater Habitats Trust to create a series of seasonal ponds on Chailey Common (Figure 2)
- Advised a number of other landowners on pond creation and the maintenance or creation of wet areas in the landscape

Figure 2. Pocket ponds (top) and small ponds (bottom) created on Chailey Common

Other seasonal water storage

Reconnecting streams to their floodplains, and creating other temporary water storage areas across the landscape can help to reduce flood peaks, and provide multiple benefits to wildlife and society, such as reducing sediment and pollution in rivers, and fertilising floodplains. Features such as wader scrapes, and shallow in-field hollows can be incorporated into the landscape to store large amounts of water, with minimal disruption to land use.

This year, the Sussex Flow Initiative has advised landowners on the creation of a number of seasonal water storage areas. In particular we created a network of seven wildlife scrapes along a relict stream channel (Figure 3). This gravity fed valley bottom collects and stores rain water, surface water run-off, and floodwater from a headwater chalk stream that was historically culverted under a field. We estimate that the scrapes help to store between 350,000 and 1,350,000 L of floodwater, and with an area of approx. 4000m^2 provide important habitat for wildlife - a curlew was spotted within weeks of the project being completed.

Figure 3. A series of scrapes and swales created along a relict stream channel, storing surface run-off and fluvial flood waters

Natural woody material

By introducing strategically placed natural wood into streams and ditches, floodwater can be interrupted during high rainfall events. Natural woody material helps to slow the speed of water, temporarily backing it up and encouraging it out onto small floodplains, where greater surface roughness results in slower flows, as well as more percolation of water into soil and groundwater.

The Sussex Flow Initiative has been experimenting with different woody material structures, to show how they slow and temporarily store floodwater. In 2017/18 we installed 40 natural woody structures, estimated to be storing around 1 m^3 (1,000 litres) of water per structure during each rainfall event – or at least 40,000 litres of water.

We have advised Tilhill Forestry on the creation of woody structures in Worth Abbey, and have provided follow up advice on the management of the seven structures (storing a further 7,000 litres per event) that were created. We have also assessed woodlands throughout the Ouse catchment for their suitability for woody structures to help reduce and slow storm flow, and have worked with the University of Brighton to learn how woody material influences stream flow and channel geomorphology.

Figure 4. Leaky dams holding back water (top & bottom left), and kicker (bottom right), during a period of high flow

Subcatchment mapping

To identify the most effective places to use Natural Flood Management techniques in the Ouse catchment, we are working with the Ouse and Adur Rivers Trust to map and survey the Longford Stream sub catchment. The report will utilise Geographic Information Systems (GIS) data, including the Environment Agency's 'Working with Natural Processes' evidence base, and walk over surveys, to identify and highlight the opportunities for NFM (catchment woodland, cross-slope woodland, riparian woodland, floodplain woodland, run-off attenuation features, and floodplain reconnection) in the sub-catchment.

Catchment-wide influence of the Sussex Flow Initiative

Quantifying the effects of catchment-wide NFM interventions on a flood hydrograph is a challenging task, partly due to natural variability in precipitation over space and time, and variations in land cover/use.

This year, SFI has worked instream, and in riparian and floodplain areas, as well as throughout the wider catchment, influencing approximately 507 hectares (advice given to landowners of 1903 hectares) of land. Of this land, approximately 40 hectares (1520 hectares if including advice given to landowners) is floodplain (Flood Zone 3). We have actively influenced at least 2.25 km of the river network using instream work[2], at least 7.8 km through land-based activities[3], and potentially over 100 km by providing advice on land and habitat management.

The Sussex Flow Initiative has contributed to the restoration/creation of 11.55 hectares of priority habitat (11.1 ha of woodland[4] and 0.45 ha of open/standing water) for Environment Agency targets this year. Through collaborating with external organisations (e.g. Catchment Sensitive Farming) we have supported landowners and contributed to Countryside Stewardship applications, with two of these landowners entering into stewardship in 2018.

'Working with Natural Processes' targeting

As part of the Environment Agency's evidence base for NFM, the resource entitled 'Working with Natural Processes' (WwNP) includes a series of GIS layers highlighting NFM target areas that were identified through modelling. These layers released in October 2017, are now being used to assist with the targeting work of SFI.

Comparing SFI's delivery of Natural Flood Management in 2017-18 (targeted and organised before the release of the evidence base) retrospectively to the WwNP layers, shows that our prior targeting and delivery of tree planting somewhat aligns with these layers. For example 378 m of hedgerow is planted in areas identified as a WwNP target area for riparian planting, and a further 100 m is planted in an area identified for floodplain planting. Similarly, 0.25 ha of SFI-planted woodland is located in a WwNP target area for riparian planting, and 0.15 ha is within a target area for floodplain planting.

[2] Based on an estimated 50 m of influence per woody structure

[3] Only including waterbodies downslope and adjacent to tree planting (i.e. not including downstream effects)

[4] Including hedgerow (320 m of hedgerow is equivalent to 1 Ha of woodland in terms of number of trees/shrubs planted)

The WwNP layers will prove useful in assisting us to target landowners, however it is also necessary to work opportunistically and to ground-truth these models to ensure that local opportunities are not being missed or wrongly identified.

Volunteers & 'in kind' support

An important aspect of NFM is the ability to empower communities to actively increase their resilience to flooding. Without the support from local communities, landowners and volunteers, the delivery of NFM in the Ouse catchment would be significantly reduced. In 2017/18 we received huge support from a team of dedicated and enthusiastic volunteers from local communities, project partners, and other stakeholders (e.g. water companies, local companies). This included:

- More than 900 volunteer hours from more than 115 volunteers, with a value in excess of £12,800[5]
- Our main partner organisation contributing around £33,250 of their time 'in kind'[6]
- Other organisations and landowners contributing at least £10,200 of their time 'in kind'

Figure 5. Volunteers from stakeholder groups (Southern Water [top left], Environment Agency [top right] and local community [bottom])

[5] Based on £100 per day for volunteers

[6] Based on Woodland Trust, EA, Sussex Wildlife Trust & Sussex Biodiversity Records Centre including trees and comms support

Providing ecosystem services through Natural Flood Management

One of the most important features of natural flood management is that it can deliver multiple benefits for both the environment and people. This means that not only does it help to reduce flood risk and increase drought resilience, but it also provides a whole range of other natural services (see Appendix B) on which society are reliant upon. This includes provisioning, regulating and cultural ecosystem services:

Provisioning services

- *Biodiversity:* Woodlands, hedgerows, open water features and wetlands have been created/restored, providing important habitat and food resources for a range of wildlife. This work helps improve the connectedness of local and regional habitat through enhanced ecological networks, and can therefore help to improve the resilience of species to climate change. Rare, native tree species have been planted, adding to the potential genetic diversity and natural survival of these species.
- *Shelter:* Hedgerows and woodland areas will provide shelter for livestock from rain, wind or sun, which is an important aspect of animal husbandry.
- *Timber and fuel:* The woodlands planted by SFI comprise numerous species with a tradition of coppicing (e.g. hazel, sweet chestnut, field maple, oak), and can be managed to provide a renewable source of timber or fuel.
- *Food:* Hedgerows and woodlands are an important source of fruit, nuts and berries for people and a range of wildlife. Improved in-stream habitat and shading helps to ensure healthier populations of fish.

Regulating services

- *Pollination:* Hedgerows and shaws have been planted using > 17,900 native flowering trees and shrubs, with > 16,000 of them planted in Buglife's B-line pollinator corridors, providing a food source for a range of pollinators.
- *Carbon Sequestration:* Every year, until they are mature, the equivalent of 11 hectares of new woodland/hedgerow will be providing CO^2 storage, with a predicted total of up to 8,800 tonnes of carbon dioxide stored.[7]
- *Water purification:* Our advice on land adjacent to > 7.5 km of watercourse failing to meet Water Framework Directive (WFD) environmental quality standards for phosphorous, has included measures to reduce surface run-off and soil erosion, which would in turn help to reduce phosphorus delivery to these waterbodies.
- *Water storage & flood regulation:* Using flood storage ponds, de-gripping, seasonal water storage, woody structures and pocket pond creation we have created up to 1,398,200 litres of additional flood storage per flood event. In addition, when mature we estimate that our new cross-slope hedgerows (1.80 km) will help to store and slow down over 5,400 m^3 (5,400,000 litres) of water during rainy periods[8]. Our NFM delivery has taken place upstream of 16 properties considered to be at "very

[7] Forestry Commission, https://bit.ly/2Ir8XNU [accessed 2018] - If forest were left to grow old naturally taking into account natural disturbance, carbon storage is estimated to be 170 to 220 tC (or 620 to 800 tCO2) per hectare.

[8] Hedgelink, https://bit.ly/2IlPKRJ [accessed 2018] - *A 50m hedgerow at the bottom of a 1ha field can store between 150 and 375 cubic metres of water during rainy periods.*

significant risk" of flooding, according to the Environment Agency. Advice on flood water storage has been given following all site visits (34 visits during 2017-18), with these sites being upstream of 17 properties, and in close proximity (< 150 m) upstream of three of these properties, considered by the Environment Agency to be at "very significant risk" of flooding.

- *Soil erosion and health:* Hedgerows and woodland (Figure 6) will help to break up compacted clay soils, allowing them to hold more water, and will help to reduce erosion by wind and water.

Figure 6. Woodland planting on heavy clay soil on slopes adjacent to the River Uck, at the Sussex Horse Rescue Trust

Cultural Services

- *Cultural benefits:* SFI has supported the River Ouse Meadows Project to protect culturally important meadow landscapes.
- *Human health:* We have provided advice, support and funding to local communities, helping to create a more connected and diverse landscape with corresponding benefits to human health and welfare. Hedgerows & woodlands provide buffers to roads with benefits to air quality.
- *Connecting people with their local environment - recreation and aesthetic experiences:* Many of the hedgerows and woodlands are adjacent or in close proximity to public rights of way, ensuring that these features can be appreciated by a large number of people.
- *Restoring historic landscape features:* Hedgerows have been a part of the British landscape for centuries, and are iconic features of rural areas. By planting hedgerows and woodland in areas where they were previously located, SFI are contributing to the conservation/restoration of rural landscapes and heritage in Sussex.

The multiple benefits of Natural Flood Management have been highlighted in the Environment Agency's 'Working with Natural Processes' evidence base, which includes 'benefit wheels' for a wide range of techniques. Examples of these are shown in Figure 7.

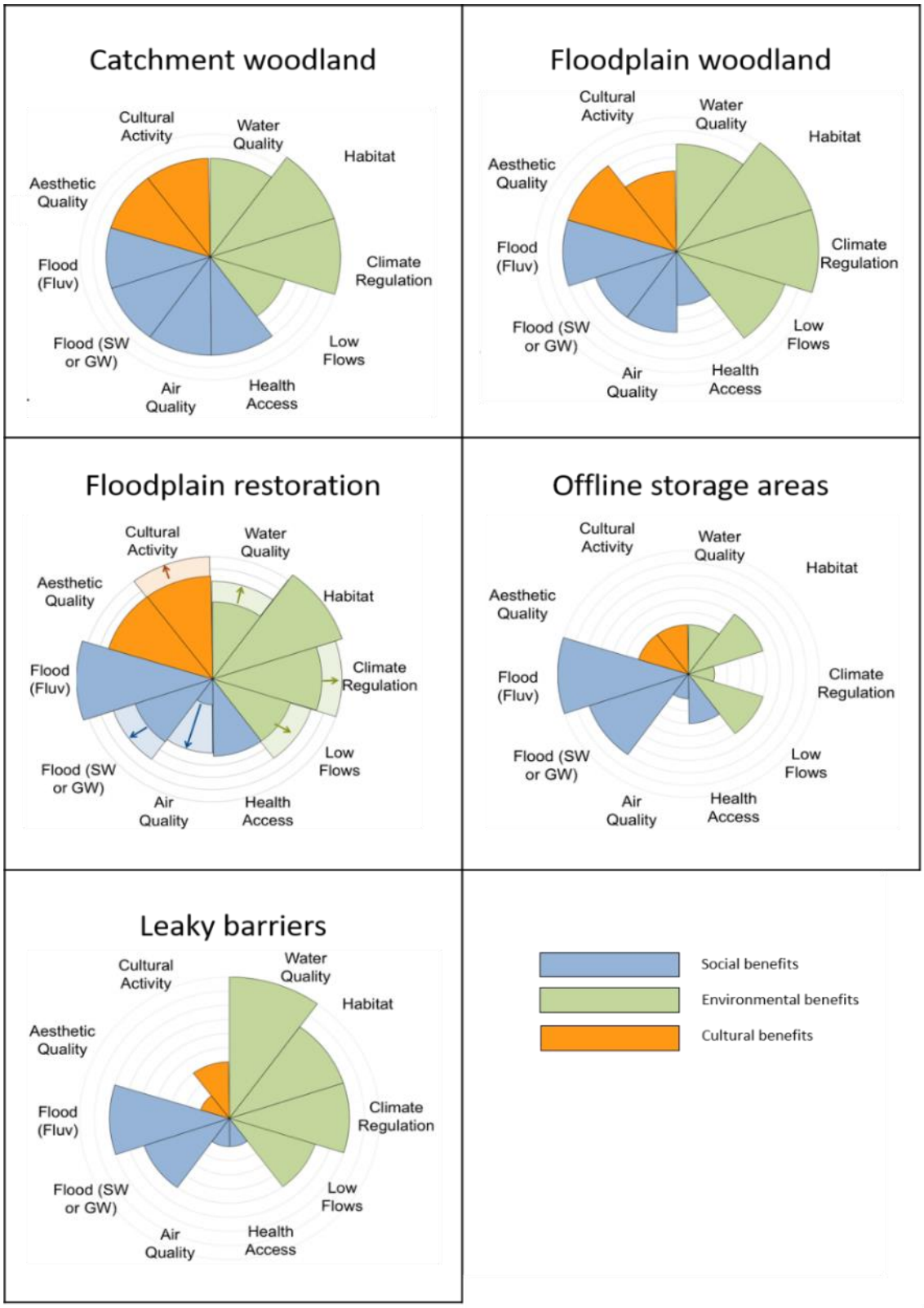


Figure 7. Multiple benefits provided by Natural Flood Management techniques (EA, 2017)

Advocacy

A core role of the Sussex Flow Initiative is to advocate the use of best practice Natural Flood Management, and to provide support to those wishing to use NFM techniques. This advocacy has involved engagement with landowners, local district councils, county councils, the Environment Agency, NGO's and many more:

Landowners

- We have visited 29 landowners on 34 sites, covering approximately 3% of the land upstream of Lewes, on a total of at least 1,903 hectares of land
- Of these 34 sites, 13 included floodplain areas on 'main river' or 'ordinary watercourses'

For a map showing the extent of the land that we advised over the last year, see Appendix A**.**

Contributing to the evidence base

The Sussex Flow Initiative has supported academics and students in their research into aspects of NFM including:

- Design of coarse woody material structures and their influence on channel flow and geomorphology
- Modelling of hydrological processes including surface water flow and groundwater flow (e.g. SHETRANS)

We have worked with, and been supported by other national flagship NFM projects including:

- EA Working with Natural Processes (WwNP)
- National Environment Research Council
- Stroud Rural Sustainable Drainage project (RSuDS)

The Sussex Flow Initiative has also provided information and expertise to NFM projects including as the Arun Valley Vision Group and the Crowhurst catchment NFM project.

Flood risk agencies and organisations

The Sussex Flow Initiative continues to work closely with Lead Local Flood Authorities (LLFA) and others who have a statutory duty to prevent flooding of residential properties, businesses, and infrastructure. By engaging with these groups, SFI is directly influencing the future of flood management in the area, and increasing the likelihood of sustainable approaches being embraced. We have engaged with the following flood authorities and groups over the last year:

- Lead Local Flood Authorities;
- Lewes District Council;
- East Sussex County Council;
- Regional Flood and Coastal Committee;
- Flood and Coastal Risk Managers;
- Planning Authorities;
- DEFRA
- Local Flood Action Groups

Working in partnership

Over the last year we have worked with a range of local and national groups and stakeholders including:

Working with local communities

An important benefit of NFM is its ability to empower local people to increase the resilience of their communities to flooding. Through volunteer tree planting days at the Sussex Horse Rescue Trust (Uckfield), and natural woody dam days at Kiln wood (Blackboys), SFI has connected with local people giving them an opportunity to take positive action to reduce flood risk, providing information on the projects objectives and the theory behind NFM.

As well as the immediate local community, Hurstpierpoint College were also involved with the woodland planting at the Sussex Horse Rescue Trust, which allowed the project to engage with a new target audience, and to encourage the students to consider traditional and innovative land management practices and to connect with nature. Working in partnership with the Sussex Wildlife Trust's Forest Schools program and East Sussex County Council, has allowed the project to reach out to Chailey School pupils who helped us to implement NFM techniques on Chailey Common, inspiring the younger generation to value, utilise and explore their local environment.

We have also been working with a number of Catchment Partnerships and others to encourage wider uptake of NFM.

Figure 8. Volunteers from the local community getting involved with Natural Flood Management (hedgerow planting with Uckfield residents [left], woodland planting with Hurstpierpoint College [centre], leaky dams with Chailey School [right])

Events and conferences

To disseminate the experiences and findings of SFI, we have presented at national and local events including:

- CIWEM conference
- Adur and Ouse Catchment Partnership;
- Lewes Trust Tree Charter;
- Arun Valley Vision Group;

Through these events we have reached an audience of at least 300 people.

Training and signposting

By providing information to a variety of organisations, and by training contractors who work across Sussex and beyond, SFI has facilitated the uptake of NFM approaches both within the project area and further afield. For example, we have advised Tilhill Forestry on NFM techniques led to the installation of woody structures in streams at Worth Abbey in the Shell Brook sub-catchment of the River Ouse. We are also working closely with Catchment Sensitive Farming Officers to share best practice NFM implementation for water quality as well as flood risk management.

Websites and social media

The Sussex Flow Initiative continues to build its online presence by maintaining a comprehensive website and blog, as well as a Sussex Wildlife Trust SFI page, and social media/networking accounts. Sussex Wildlife Trust pages attracted over 1000 views throughout the year, and the SFI twitter account and tweets resulted in more than 59,400 'impressions' (views) and 1000 'engagements' (interactions with an SFI tweet). Our work has also been publicised on the Woodland Trust website, including an article on leaky dams and a case study on the Sussex Flow Initiative project, which had a combined total of 129 unique views in 2017/18.

In addition to written outputs, we have uploaded videos of tree planting and woody debris dams to YouTube, which have received more than 400 views in the past year.

Print Media

A number of articles have been published in magazines and newspapers, including an article in the Sussex Wildlife Trust 'Wildlife' magazine (readership of > 32,000), a piece in the Sussex Express (readership of > 12,000), and a feature in the Woodland Trust's 'Broadleaf' magazine (readership of > 64,000).

Radio

Sussex Flow Initiative was interviewed on BBC Sussex during their 'drive time' show about the principles of Natural Flood Management. The radio station has > 260,000 weekly listeners across East and West Sussex.

Case studies

To encourage the uptake of a wide range of NFM techniques, SFI has produced some introductory case studies that will act as a useful resource for organisations new to NFM, those wishing to explore new techniques, and those interested in finding examples of collaboration, funding and NFM delivery. To date, there has been little information available on utilising NFM in lowland catchments, so these case studies can provide organisations working in catchments with similar characteristics, with examples of how NFM can be used in such situations. These case studies include utilising wood in rivers, woodland and hedgerow planting, and washland restoration.

The future of Natural Flood Management and the Sussex Flow Initiative

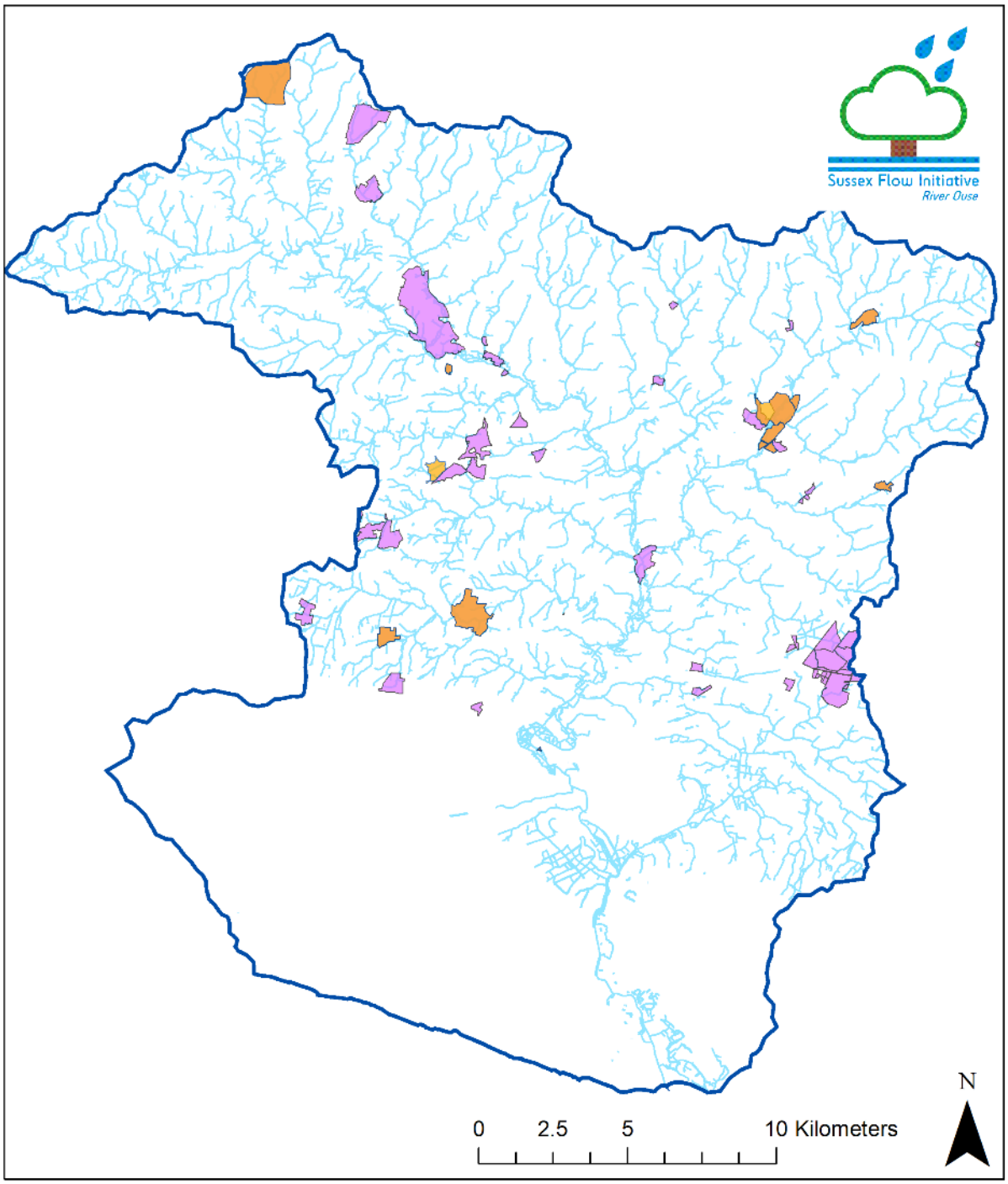
This year, the Environment Agency launched a National Programme of NFM, which SFI will be helping to inform, support and deliver. We are pleased that this milestone has been reached, and that Natural Flood Management has been accepted nationally as one of the primary means to achieve sustainable flood and water management. We will be helping to train and upskill as many people as we can in NFM measures and how to apply them in an informed and effective way.

Over the coming years we will remain focused on delivery and advocacy and have set out ambitious targets for the future of SFI in our five-year vision document. During 2017/18 we have made significant progress towards many of these targets (see Appendix C).

We are excited to further engage with the local communities in the Ouse catchment, and expand our volunteer base, ensuring that we continue to step up the delivery of NFM throughout the catchment. We will continue to strive to provide best practice examples of NFM in lowland catchments, foster collaboration with a variety of stakeholders, and maximise the dissemination of our work.

Appendices

Appendix A. Landowner visits 2017/18



Legend

- Advised and work delivered 2017/2018
- Landowners advised 2017/2018
- Detailed river network

Appendix B. UK NEA services provided by the 3 main strands of SFI Project work

Ecosystem service	ES from SFI Semi Nat Grasslands / Washlands	ES from SFI Woodland	ES from SFI Fresh & Openwaters, Wetlands & Floodplains
Food	●	●	●
Water	●	●	●
Timber		●	●
Woodfuel		●	
Biofuel (incl Peat)			
Bioenergy			
Health Products			
Fibre			●
Species Diversity	●	●	●
Genetic Reserves	●	●	●
Disease and Pest Control			
Climate Regulation	●	●	●
Erosion Control	●	●	●
Water Regulation	●	●	●
Flood Regulation	●	●	●
Fire Hazard Regulation			
Air Quality Regulation	●	●	
Water Quality Regulation	●	●	●
Soil Quality Regulation	●	●	●
Noise Regulation		●	
Recreation	●	●	●
Tourism	●		
Aesthetic Values	●	●	●
Cultural Heritage	●	●	●
Employment	●	●	●
Spiritual Values	●		
Education	●	●	●
Sense of Place	●	●	●
Health Benefits	●	●	
Navigation			
TOTAL	**20**	**21**	**18**

Appendix C. Sussex Flow Initiative five-year targets

Five-year targets (2017 – 2022)	Progress towards target in 2017 – 2018
High level targets	
In the long term (10 years +), to influence at least 20% of the catchment (13,430 ha) and to support the creation of 40% woody cover in the upper third of the catchment, and 20% woodland cover in the central third of the catchment and/or influence 20% of river length (240 km)	> 10.05 km of river/stream influenced (>100 km potentially influenced by advice given) Advice on 1,903 ha of land
Aim to show a reduction in peak flows from intense rainfall events with a subsequent reduction in risk to existing properties in flood risk areas. Working from baseline hydrometric data (where available), work with EA to seek to quantify the reduction in flood flows and risk to existing properties	16 properties at risk of flooding are downstream of NFM measures we have implemented
Aim to show a positive influence on water quality / WFD failing waterbodies	Advice given to landowners adjacent to > 7.5 km of river/stream failing to meet WFD targets for phosphorous
Habitat Delivery and NFM	
At least 100 Large Woody Debris (LWD) dams installed	47 woody material structures installed (including seven advised)
1,500,000 litres of additional seasonal water storage created	Between 398,200 L and 1,398,200 L created Scrapes storing 350,000 – 1,350,000 L LWD slowing approx. 47,000 L per rain event 1200 L stored in pocket ponds Cross-slope hedgerows storing at least 5,400,000 litres of water during rainy periods
25 ha of priority habitat created including : Minimum 10 ha woodland planting and Minimum 10 km hedgerow planting Open water – 15 ponds enhanced / restored and/or 10,000 m² of open water created	11.55 ha of priority habitat (if hedgerows counted as woodland): 1.77 ha of woodland created 2.97 km of hedgerow planted At least 4500 m^2 of seasonal open water created
Strategic and Catchment Scale	
Two sub catchment plans written	
At least one sub catchment plan implemented	
Flagship projects funded and initiated with EA, RFCC and at least one new Lead Local Flood Authority	
At least 30 people trained and upskilled in NFM techniques via river habitat workshops, staff training days, new comms/events	Training of ten contractors and staff digging wildlife scrapes, ponds and installing woody material
A further 15,000 tonnes of potential carbon storage created	Up to 8,800 tonnes of carbon storage created by hedgerow and woodland planting
Natural capital and multiple benefits of the work we have achieved clearly articulated for all	Case studies and blog posts have been produced, highlighting the multiple benefits that SFI activities will result in
At least 10 external sites supported to carry out additional NFM works	

Engagement and Advocacy	
Engagement and influence of at least 5,000 people	Potentially >200, 000[9] people reached with varying levels of engagement and influence. High level engagement includes community engagement with >115 volunteers, >300 people at conferences and local events, >1500 views to SFI articles/web pages and >1000 interactions on twitter
At least 10,000 ha of land advised and engaged with on NFM	1,903 ha of land advised
At least 20 events held or SFI represented	Five events (CIWEM conference; Adur and Ouse Catchment Partnership; Lewes Tree Charter; Arun Valley Vision Group; Transition Town Worthing)
At least two advisory leaflets written and published	
Publish information (TV, radio, websites, tweets) which reaches potential audiences of at least 100,000	Reached an audience of approx. 169,000, plus a radio interview on BBC Sussex which has weekly listener numbers of > 260,000
Publish at least five case studies / National Guidance Documents on the work that we have achieved	Three case studies have been produced highlighting project work
Budget and Finance	
Attract at least £200,000 of in kind funding	At least £56,250 of in kind funding
Generate at least £50,000 of further income	£47,984 grant received from Bannister Fund £5,000 Woodland Trust fencing fund LDC funding
Evidence and Research	
Generate a legacy of experimental research projects with key universities, CABA (Catchment Based Approach), the Environment Agency and others; at least 5 research projects supported	
Work with existing organisations who can assist with long term monitoring (e.g. Rivers Trusts)	
Others we have influenced to deliver KPI's	
Influence at least ten others to deliver on KPI's	Woodland Trust Forestry Commission East Sussex County Council Lewes District Council Adur & Ouse Catchment Partnership Tilhill Forestry

[9] Based on 37,000 listeners to the radio interview (260,000 weekly listeners divided by seven days)