

A study of stakeholders' perceptions of Natural Flood Management and how this affects uptake across Hampshire

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Contents

1.0	Introduction	3
1.1	Abstract	3
1.2	Keys questions to be answered	3
1.3	Hypothesis	4
2.0	Literature Review	5
3.0	Methodology	8
3.1	Research Ethics	8
3.2	Types of research	8
4.0	Results and Discussion	9
4.1	Results from Questionnaires	9
4.1.1	Questionnaire Summary	19
4.2	Results from Workshop	20
4.2.1	Workshop Summary	21
4.3	Results from Interviews	23
4.3.1	Interview Summary	27
5.0	Key Findings	28
5.1	Sampling Bias	28
5.2	Key Finding Themes	28
5.3	Key Finding Summary	30
6.0	Conclusions	31
	Bibliography	33
	Appendices	35
	Appendix A Interview with Stuart Jarvis	35
	Appendix B Interview with Rob Humby	41
	Appendix C Interview with Felicity Roe, Steve Clow and Roseanne Salt	47
	Appendix D Advert for NFM event	53
	Appendix E Agenda for NFM event	53
	Appendix F Summary of NFM questionnaire responses	54
	Appendix G NFM questionnaire summary article	56

1.0 INTRODUCTION

1.1 Abstract

As a local resident who has worked for Hampshire County Council in the area of sustainability and environmental science for ten years, I have a strong interest in helping Hampshire become resilient and prosperous for future generations. Climate Change has the potential to have a significant impact on our environment and sense of place in Hampshire, we need to be acting now to help mitigate the negative effects of this and associated natural environmental hazards (such as drought and flooding) and ensure that we are in a position to manage them effectively in years to come.

As development to provide housing, employment and essential infrastructure for residents in Hampshire escalates annually, Flood Risk and Coastal Erosion Risk Management (FRCERM) and flood mitigation have become increasingly popular and important topics of conversation throughout the world of planning, local government and development. Interest in the subject has led to a plethora of guidance documents being created by government organisations and environmental charities.

Unfortunately, despite a recent increase in guidance from international organisations and UK central government, the uptake of Natural Flood Management (NFM) techniques including Sustainable Drainage Systems (SuDS) and Working with Natural Processes (WWNP) remains slight. Working in a political organisation, I am really interested in finding out how people's perceptions can affect decisions made about projects which can potentially help alleviate the effects of Climate Change; mitigate the risks of flooding; make significant cost savings and improve ecology and biodiversity.

It is often the case that the majority of barriers to NFM are simply miss-perceived or significantly exaggerated in order to allow traditional and better understood methods of drainage to be employed.

This paper attempts to explore the perceptions that developers, politicians, highways authorities and landowners have garnered of Natural Flood Management from a variety of sources which have led them to feel unable to support and champion NFM schemes in Hampshire.

1.2 Key questions to be answered

- What do people perceive the barriers to NFM to be?
- How and why have people formed these perceptions?
- How can we, as a political organisation with certain powers, begin to change people's minds?



Figure 1: 'Problems of Perception'. Sidney Harris

March 1, 2022

1.3 Hypothesis

Based on my investigation thus far into the subject matter I have proposed the following hypothesis as an explanation for perceived barriers to NFM, as a starting point for further investigation. I believe that there is a suite of perceived barriers to Natural Flood Management which significantly increase the challenge of acceptance of NFM schemes as routine. These perceptions include:

- **Lack of knowledge** of NFM schemes by members of the public; Local Planning Authorities; developers; landowners/farmers and highway engineers etc
- **Evidence base** is lacking and there are very few examples of successful NFM schemes which have sufficient monitoring and data to prove they're efficacy
- **Concerns** over overall responsibility for schemes, insurance liability, adoption of assets and ongoing maintenance
- **Going against traditional engineering** techniques which have been 'tried and tested' including barriers and pipes
- **Upstream/differing landowners** unable to see 'what's in it for me?' when works take place on their land but they see no benefit
- **Highways Authority's requirements** for adoption of NFM assets
- **Political timescales** can be viewed as an issue within local government as whether results can be seen within 4 years can be a limiting factor
- **Problems associated with partnership working** and collaboration between so many stakeholders
- **Permissions required** including Ordinary Watercourse Consents, discharge licences, liability cover
- **Cost** and funding issues, including the complications of funding bids and clarity of which organisations are responsible for funding

I believe these barriers are perceived to be far greater and more of an inhibitor than they actually are and that these perceptions have been constructed through members of the public being exposed to negative opinions of NFM, through various stimuli such as media reports and personal experience.

With Hampshire County Council's recent commitment to undertake a Commission of Inquiry, which will examine key issues and consider evidence across a number of headings to help inform a Vision for Hampshire in 2050, I believe it is an ideal opportunity to tackle some of these 'softer, social' barriers to new methodologies for land management and flood mitigation.

The process of forming a perception can be described as a series of steps which eventually lead to an individual interpretation of a situation based on a selection of stimuli or sensations garnered from our environment. In very basic terms, as a physical process, it can be shown as below:



Figure 2: Process of forming a perception

Therefore, in order to understand how the perceptions of NFM across Hampshire have been formed over the years I need to look into what stimuli areas are available to our stakeholders, how these are then selected and organised by these groups and then how they are interpreted.

2.0 Literature review

Working within the flood and water management sector, it is well understood that the practical issues of implementing any Flood Alleviation Scheme (FAS) are many and complex. It is often overlooked by those outside of the sector just how complicated overcoming the myriad social, psychological, legal and historical barriers is and how to tackle this.

Perception is described by the Oxford English Dictionary as *‘interpreting or regarding (someone or something) in a particular way’*. It is an incredibly powerful emotion and can be shaped significantly by many factors. Freud stated that *‘the new-born, in complete helplessness, strives only for reduction and discharge of tension and wants to abolish the stimuli of the world into which he is born.’* In other words, people don’t want the increased stress of added opinions and external provocation when making decisions. However, there is evidence that suggests that people’s perceptions of public figures, environmental concerns and responsibility account for a significant percentage of political and social decisions made by members of the public and can create perceived barriers to behaviour change.

How information is conveyed to the public and wider stakeholders is incredibly important and has a significant effect on whether the audience believes or takes on board the messages being given. Careful thought should be given to who relays information, how that person presents themselves and even what they are wearing. It is noted that *‘people’s opinions of political figures influence how plausible they believe the information they provide to be, even when the information is incorrect’* (Swire et al. 2017).

Another noted phenomenon which effects perception of information is the so-called ‘White coat effect’ - Formal attire increases perceptions of authority. When accompanied by a white coat the perception of authority increases (Brase & Richmond, 2004). In other words, if someone who looks smart and seem to know what they are talking about, such as engineers and doctors, the messages being conveyed will be believed by the audience, and will add to a perception of a certain scheme or method as being correct.

Although Nazmul states that *‘perceptions of different stakeholders towards ecosystem and ecosystem services are seldom taken into account for decision making’* (Nazmul, H, 2017) I have found through research and experience that in the area of flood risk management, this is not the case. When partaking in consultation with landowners and local residents regarding potential flood risk mitigation activities, a lot of significance is placed on relying on ‘what we’ve always done before’; the opinions of drainage engineers; a belief on concrete pipes; a mistrust of the unknown. This can be accredited to the ‘white coat’ effect, i.e. a drainage engineer, whose business is concrete pipes, must know what they are talking about.

In the flood and water management sector, the majority of processes and procedures are legislated by central government including planning laws, highway laws and land drainage law. It is understood by the majority of people to be a highly regulated area with well understood drainage processes, standard details, concrete pipes etc.

When people are used to these ideas, and believe them to be well understood, there is often a sense of ‘if it ain’t broke, don’t fix it’. However, with the effects of climate change becoming ever more apparent in our world, and traditional drainage systems in developments and highways becoming overwhelmed and surcharging more regularly, it is time to think differently about water management. *‘Recent research shows that flood risks may increase by a factor of almost 30 times and that traditional engineering measures alone are unlikely to be able to provide protection’* (R.M.Ashley, D.J Balmforth, A.J Saul and J.D.Blanksby, 2005)

Many alternative methods of controlling flood risk are now common language in the water management sector including Blue/Green infrastructure, Natural Flood Management (NFM) and Sustainable Drainage Systems (SuDS). However, it is not just the technology that needs to change, it is also how they are understood and perceived. *‘Therefore, residents’ perceptions of the benefits and problems of living with SuDS are important’* (Williams et al, 2019)

'Flooding is one of the most frequent and costly weather-related disasters in Europe' (Bubeck et al, 2012) Significant sums of money have been invested in flood defences over the past century, however, *'there is evidence pointing towards many hard engineering solutions of the 20th century increasing flood risk rather than reducing it'* (Guangwei Huang, 2014). In light of research such as this, many flood risk management authorities (RMAs) are beginning to look beyond traditional 'drainage' solutions in order to address surface water management (SWM) for new and existing development.

In line with the UK government's recent 25-year environment plan, DEFRA's recent Flood Risk Management policy statement and the EA's FCERM strategy, nature-based solutions for flood risk are being heralded as the way forward for water management in the UK. A particular urgency is being attached to these plans as it is now widely recognised across all sectors that *'flooding is one of the key risks facing the UK from climate change'* (Holmes.G 2018)

Natural Flood Management (NFM) and Working with Natural Processes (WWNP) techniques are not a new concept and have been used by landowners for many thousands of years. The process *'involves balancing and integrating the restoration of natural features and processes with existing land uses'* (Forbes; Ball; McLay et al. 2015). *There has recently been a resurgence of interest in these techniques and NFM is currently of interest in many countries worldwide* (Wesselink et al., 2015)

'NFM can benefit flood management in both river basin catchments and at coastlines' (Waylen et al, 2017) As a county with a large amount of coastline, Hampshire could potentially benefit significantly from well managed NFM schemes. It is not just a reduction in flood risk that is a benefit of well managed NFM schemes. NFM techniques including tree planting, offline storage and Sustainable Drainages Systems (SuDS) offer *'a wide range of multiple benefits to residents which include water quality improvement, habitat protection and increased urban amenity'* (Wentworth and Clark, 2016)

The aims of NFM are now widely known and understood and the techniques are generally regarded as an effective flood risk management option. Basic principles of the methodology are as follows:

- Soft engineering techniques which work with natural processes to utilise pre-existing channels, shallows and forested areas to slow the flow of water and increase infiltration in order to reduce peak flows and volumes of flood flows to mitigate the effects of flash flooding.
- Increasing open areas of water and wetlands which will benefit both flood mitigation and create habitat for ecology and biodiversity
- Incorporating NFM practises to compliment 'hard' engineered flood protection schemes
- Working directly with vulnerable residents, landowners and local communities to encourage self-resilience and ownership of mitigation efforts
- Co-ordination of works at a river basin catchment level, working across political and administrative boundaries
-

Methods and techniques for natural flood management are almost limitless, as essentially it is just mirroring nature. However, there are now several recognised methods which are associated with NFM and have a certain amount of guidance related to them. These include:

- Leaky Wooden Structures (LWSs) or Leaky dams
- Floodplain restoration
- Woodland creation
- Re-meandering of watercourses
- Upland attenuation of flood flows
- Offline storage of flood flows
- Catchment sensitive farming

Advice regarding the implementation of NFM in the form of guidance documents is widely available. Recent UK policy discussing NFM include updated National Planning Policy Framework (NPPF) guidance; the UK Government's '25 year Environment Plan' and Water UK's 'Sewers for adoption 8'

So, if NFM has been used traditionally; is being encouraged by government and RMAs; guidance and advice for the practicalities of implementing schemes is available, WWNP can offer wide multiple benefits and can help the UK's climate change challenges, why are we not seeing good quality, well-thought through NFM schemes and SuDS systems being introduced across the UK?

With regard to existing policy and guidance, the greater percentage of this is non-statutory guidance produced by partnership organisations within the flood risk sector, and as such is not able to be enforced in law, such as the Ciria SuDS manual (C753). This information is relied on by LLFAs and LPAs, however, it is noted that *'the framework is more of an enabling nature than a coercive one'* (Rouillard et al, 2010) Meaning that, although there is accessible advice on how to implement NFM, there is far less advice on how stakeholders can be persuaded to champion the processes.

In relation to this, *'barriers to SuDS uptake have been suggested in England, including weak planning enforcement, lack of national design standards, confused maintenance responsibilities and low public awareness'* (Ellis and Lundy, 2016, Melville-Shreeve et al., 2018).

Whilst exploration of survey data into known barriers to NFM implementation has been undertaken in the past (eg Bark, R; Martin-Ortega, J and Whalen, K, 2017) there is significantly less available information on how and why these perceived barriers are initially created and how potentially they could be addressed to lead to greater uptake.

It is also noted that investigation of this subject matter to date *'has tended to focus on farmers' perceptions of NFM'* (Holstead; Kenyon; Rouillard; Hopkins and Galan-Diaz, 2015). Therefore, this paper looks at a much wider stakeholder audience including housing developers, Local Planning officers, elected local government members and local residents.

In order for stakeholders to be encouraged to embrace NFM techniques, those working within the flood and water management sector need to explore and identify the challenges associated with implementing the concept of NFM (Waylen et al, 2017) and further scrutinise how the perception of these challenges changes across the differing categories of stakeholders involved. This paper attempts, through use of questionnaires; workshops and interviews, to do just that; begin to identify patterns of perceptions in certain groups of stakeholders which could be conceived as barriers to NFM implementation and begin to offer potential next steps for how these perceptions can be changed in order to increase uptake of NFM schemes across Hampshire.

Bearing all of this in mind, and with the greatest of respect to those who have undertaken all the above-mentioned work, researchers acknowledge that there are *'knowledge gaps which require filling in order to successfully challenge pre-existing ideas and institutions for flood management'*. (Huq and Stubbings, 2015) This paper attempts to fill at least some of those knowledge gaps.

3.0 Methodology

A variety of stakeholders were contacted in order to collect information on perceptions and opinions of the various factors involved with NFM. It should be noted that a significant number of these stakeholders are in some way involved in the delivery of NFM schemes across the UK and this needed to be borne in mind when interrogating the data collected.

3.1 Research Ethics

- Anyone involved in research who has not given permission for their details to be recorded have had their names redacted
- Everyone who took part in the questionnaire has given their permission for their thoughts to be published, albeit anonymously
- Those who were interviewed and whose names are listed below, have given their permission for their comments to be published

3.2 Types of research

My research and data collection took several forms including:

- **A series of questionnaires** for networks – to be sent out via e-mail (summary of questionnaire and results can be found in **Appendices F and G**)
- **A Workshop and Information Event** with key stakeholders where training and conversations were undertaken (Agenda and invitation for event can be found in **Appendices D and E**)
- **Interviews** with key County Council individuals:
 - **Stuart Jarvis** – Director of Economy, Transport and Environment (ETE) at Hampshire County Council
 - **Rob Humby** – Deputy Leader of Hampshire County Council and Executive member for Economy, Transport and Environment (ETE)
 - **Felicity Rowe** – Director of Culture, Community and Business Service (CCBS)
 - **Steve Clow** – Deputy Director of Property Service
 - **Roseanne Salt** – Senior Rural Land Surveyor

(copies of interview transcripts can be found in **Appendices A, B and C**)

It was a conscious decision on my part to include several methods of gathering data including a ‘wide angle’ approach to sending out questionnaires, this was designed to enable the largest possible audience for sampling. However, as I have mentioned before, I am aware that, due to the nature of the networks and organisations I have contacted and who I work with being significantly involved in the sector, there may be some sampling bias at play. [Please see further note on sampling bias in section 5 of this dissertation]

One on One interviews with individuals who have a significant role in Flood Risk Management in Hampshire were undertaken to be able to delve deeper into certain areas of interest for them including financial issues, political angles and overall risk management. These interviews gave me an interesting insight into the role that job responsibility has on perception.

The workshop and information event held on the 2nd March 2021, included discussions and presentations from experts in the sector. The occasion offered an opportunity for members of the public to air their personal impressions and allow perceptions and concerns to be discussed across a wide platform. NB The event was held as an online ‘virtual’ meeting due to Covid 19 restrictions in place at the time. Unfortunately, this meant that not as many individual conversations could be undertaken by myself to garner individual opinions. However, on the flip side I think that more people attended the event as there was no need to travel.

4.0 Results and discussion

The following section provides a summary of the results gleaned from the various methods of data collection and how these began to steer me towards some conclusions. Results have been displayed as graphs, excerpts from interview transcripts and discussion points from the event.

4.1 Results from Questionnaires

The questionnaire was designed to get responders to consider the wider effects of NFM schemes, how they think they may affect their environment, what factors and organisations should be included in the decision making process and whether NFM schemes can be as effective as ‘tried and tested’ drainage and flood protection methods.

A total of 217 questionnaires were sent out via e-mail to existing networks of colleagues and members of the public including:

- 13 Local Authority planning departments
- The Test and Itchen Partnership
- The board and members of the Watercress and Winterbournes project
- Community groups involved with the Test and Itchen Partnership
- Members of the Hampshire and Isle of Wight Planning Officers Group (HIPOG)

The link to the online questionnaire was also shared with parish councils and they were invited to send out to their wider communities, I am therefore unable to give a precise number of how many individuals this questionnaire eventually reached.

A total of 78 responses were received. This represents 36% of the questionnaires directly sent out to recipients.

Some questions were answered by all respondents, whilst other were only answered by a proportion of the participants. The numbers of answers received are noted on each graph. A full summary of all the respondents’ answers is included in **Appendix F**.

The following graphs have been produced to illustrate the answers received.

Q1A. WHAT NATURAL FLOOD MANAGEMENT METHODS HAVE YOU HEARD OF?

- ☒ Creating or enhancing wetlands
- ☒ Creating Ponds/Lakes that are online (connected to rivers/streams)
- ☒ Creating Ponds/Lakes that are offline(disconnected from rivers/streams but used for water storage)
- ☒ Installing permeable or leaky wooden dams
- ☒ Installing soil barriers/banks (bunds)
- ☒ Returning redirected rivers/streams to their natural course
- ☒ Returning straightened rivers/streams to their natural meander
- ☒ Daylighting

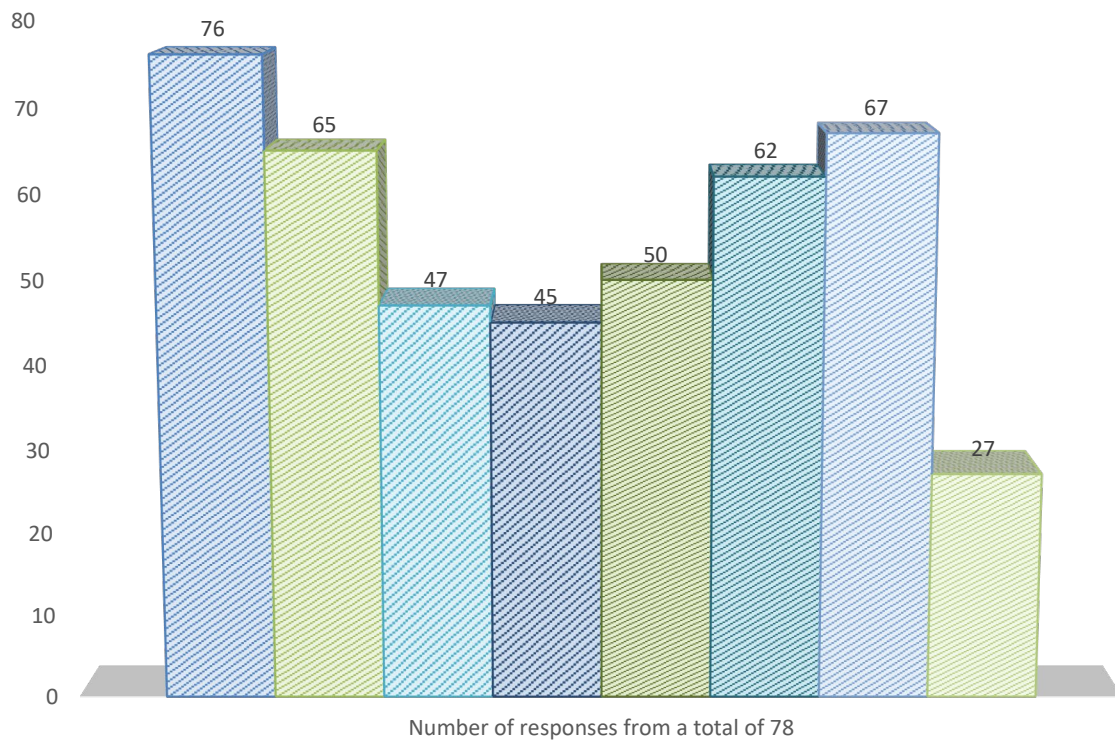


Figure 2: What Natural Flood Management methods have you heard of?

Q1B. OTHER METHODS RESPONDENTS HAVE HEARD OF

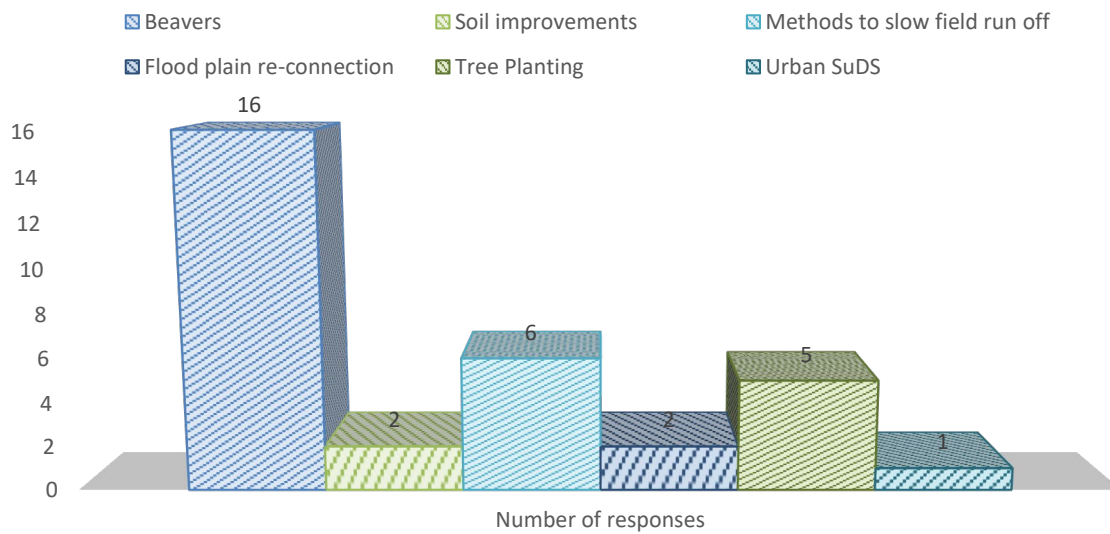


Figure 3: Other NFM methods which participants have heard of

Q2. ARE YOU AWARE OF ANY AREAS IN HAMPSHIRE WHERE NFM MEASURES HAVE BEEN IMPLEMENTED?

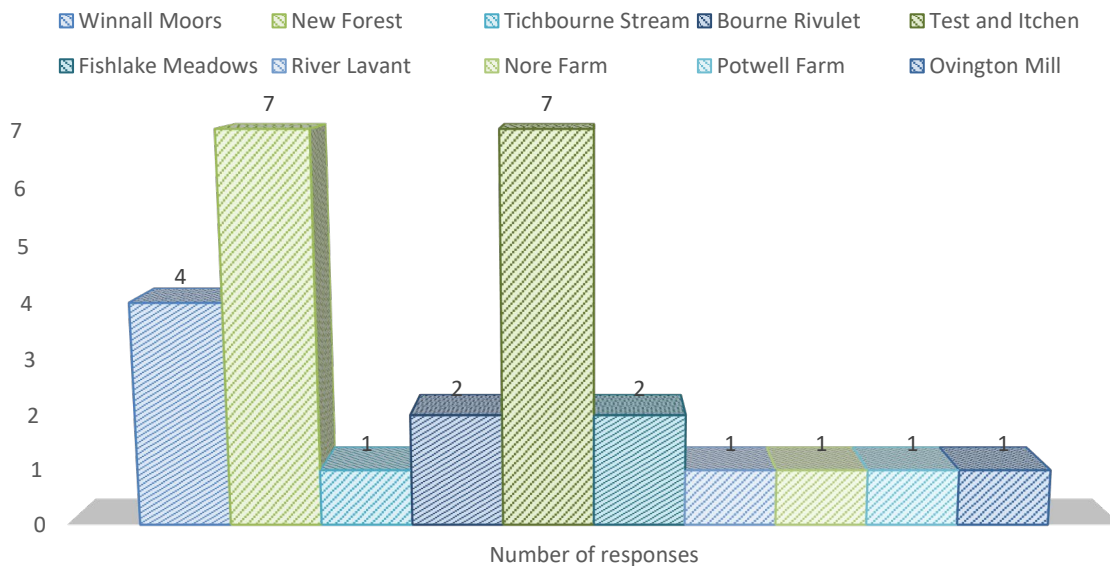


Figure 4: Areas in Hampshire where NFM schemes are taking place

Q3. HOW WOULD YOU RATE YOUR UNDERSTANDING OF HOW NFM WORKS?

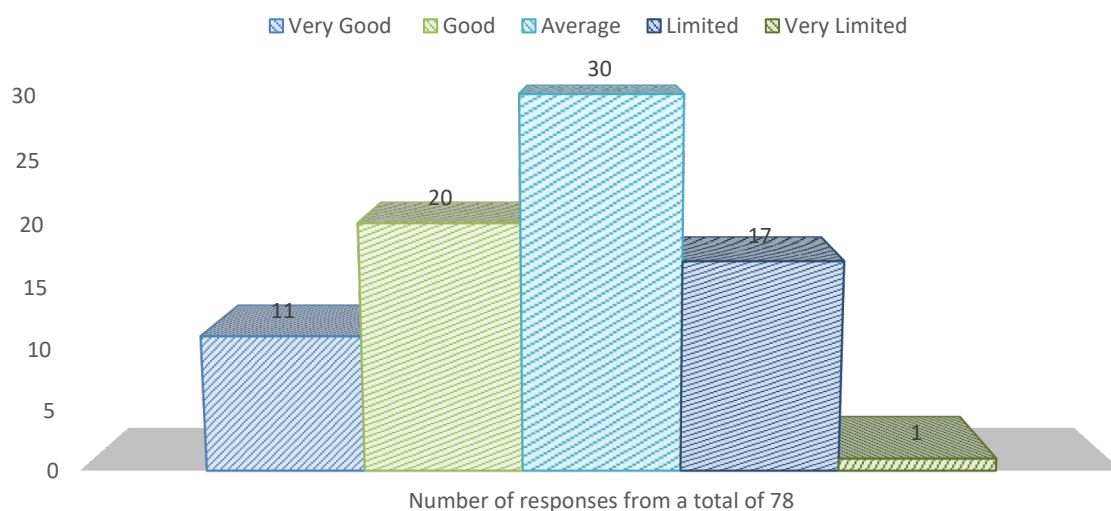


Figure 5: How would you rate your understanding of how NFM works?

Q4. HOW WOULD YOU RATE THE AVAILABLE INFORMATION AND EVIDENCE ABOUT NFM?

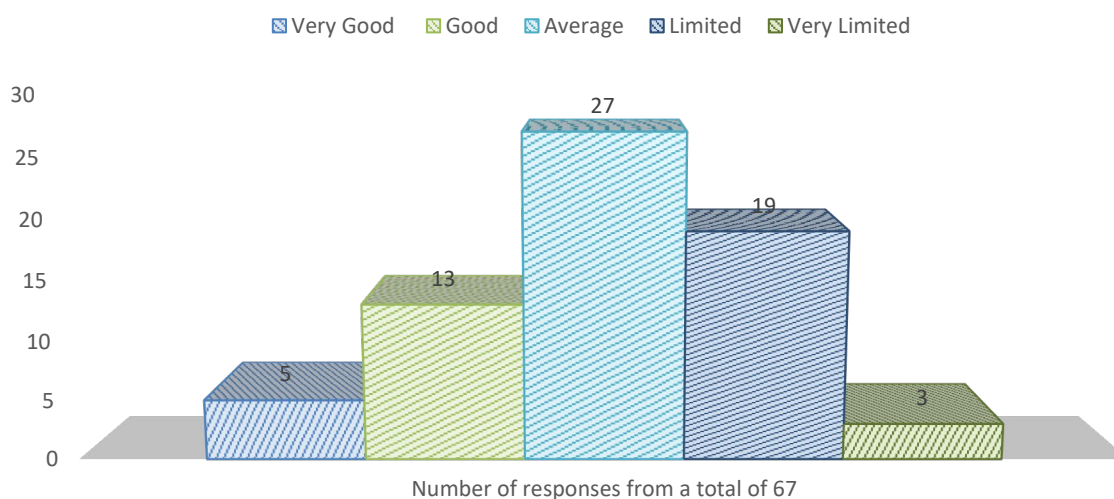


Figure 6: How would you rate the available information and evidence about NFM?

Q5. WHICH OF THE FOLLOWING DO YOU MOST ASSOCIATE WITH NFM?

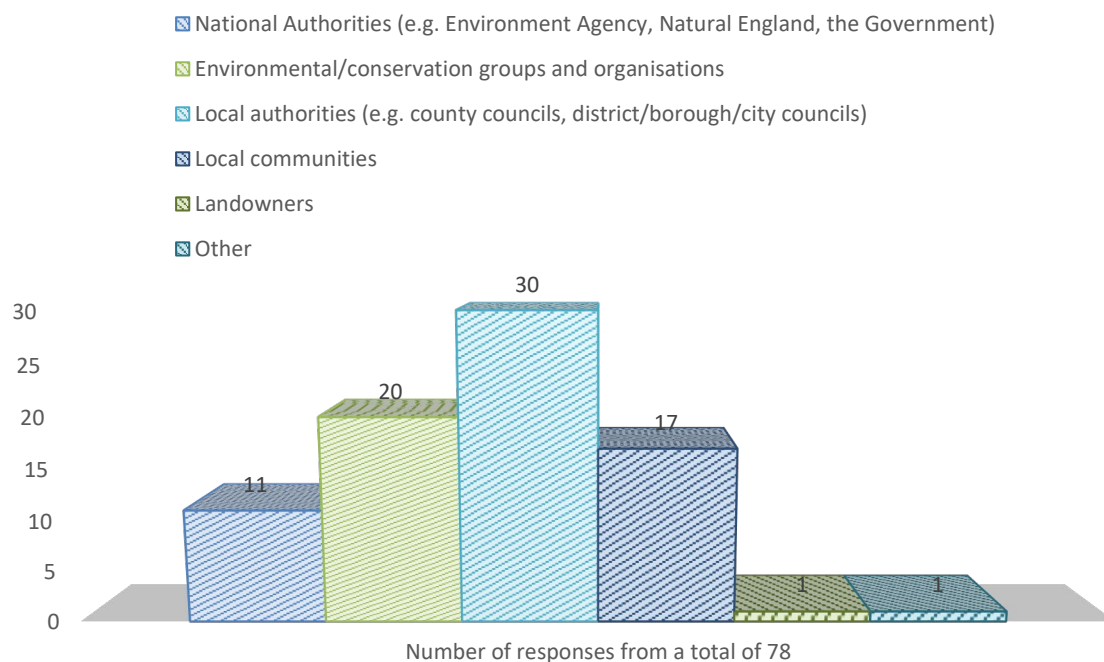


Figure 7: Which organisation do you associate with NFM?

Q6. HOW WOULD YOU RATE YOUR OPINION OF NFM?

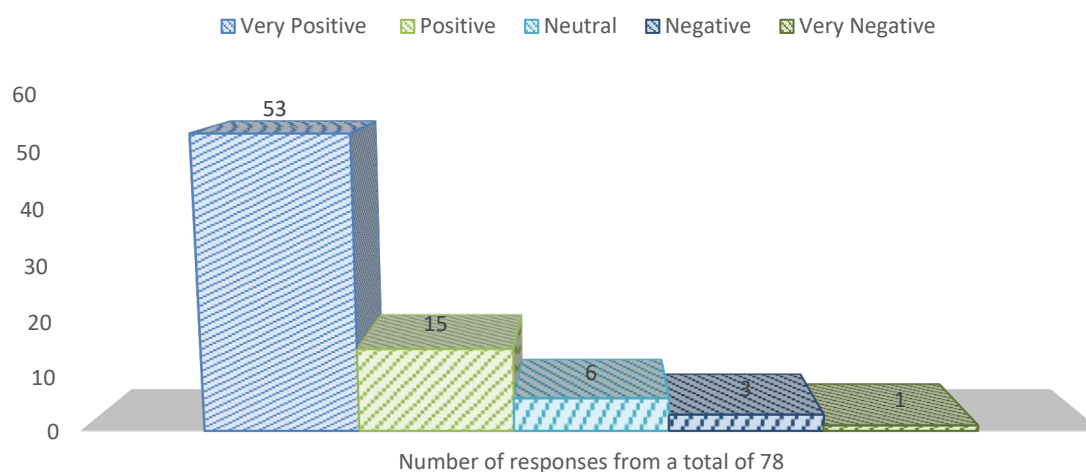


Figure 8: How would you rate your opinion of NFM?

Q7. DO YOU THINK THAT NFM IS AN EFFECTIVE METHOD FOR MANAGING FLOOD RISK?

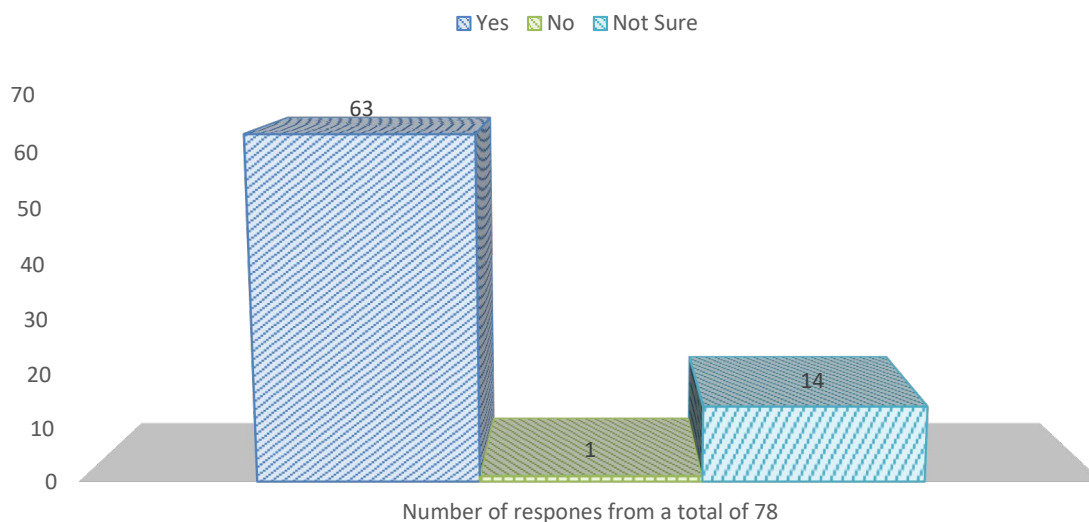


Figure 9: Do you think that NFM is an effective method for managing flood risk?

Q8. DO YOU THINK THAT FLOOD DEFENCES THAT USE HARD ENGINEERING (E.G. PIPES, CONCRETE BARRIERS) ARE A BETTER OPTION THEN NFM?

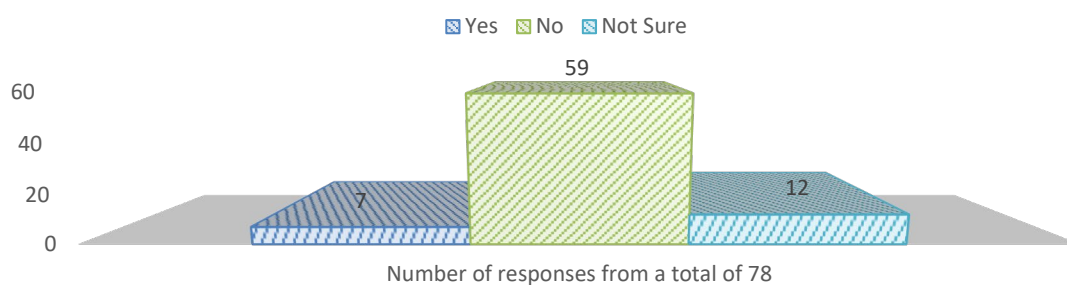


Figure 10: Do you think that flood defences that use hard engineering are a beter option than NFM?

Q9. HOW WOULD YOU FEEL ABOUT NFM MEASURES BEING IMPLEMENTED WHERE YOU LIVE?

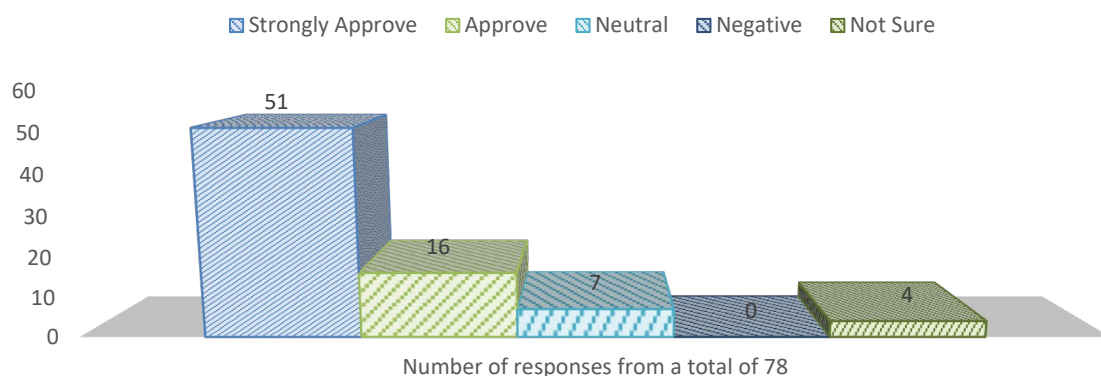


Figure 11: How would you feel about NFM measures being implemented where you live?

Q10. WHICH OF THESE WOULD BE A FACTOR IN YOUR FEELINGS?

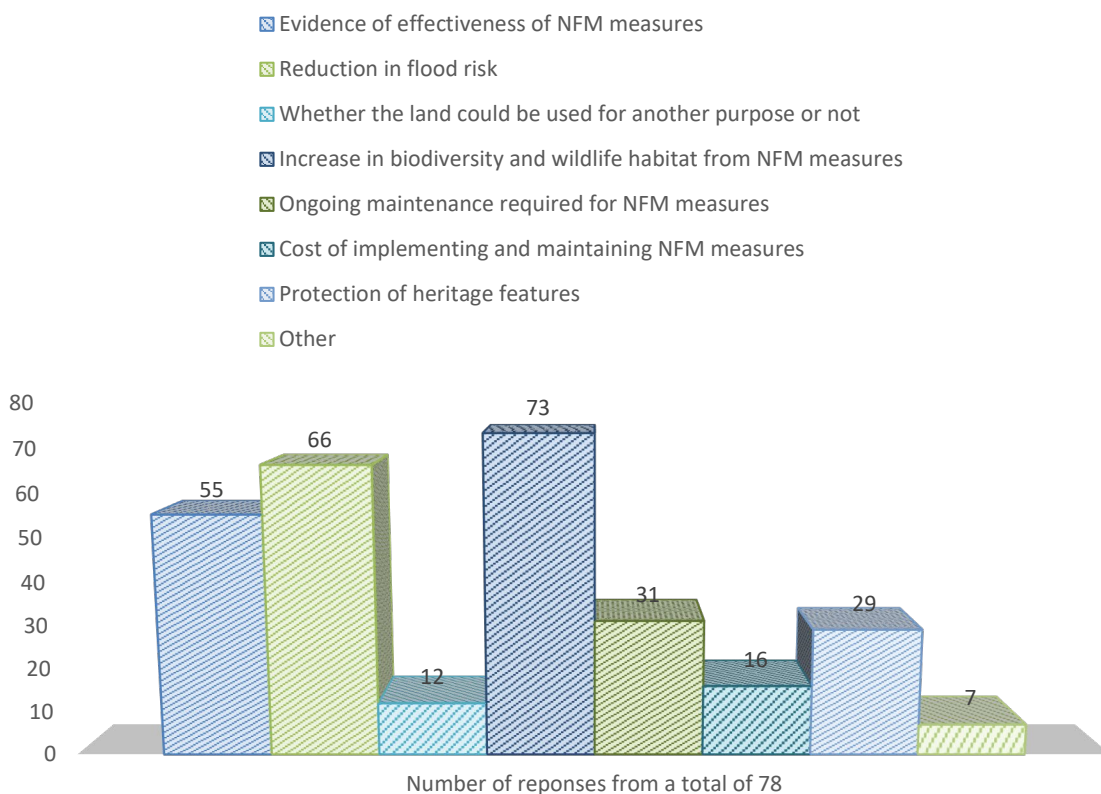


Figure 12: Factors affecting respondents' desire to see NFM measures being implemented where they live

Q11. WHO DO YOU THINK SHOULD MAKE DECISIONS ABOUT IMPLEMENTING NFM WHERE YOU LIVE?

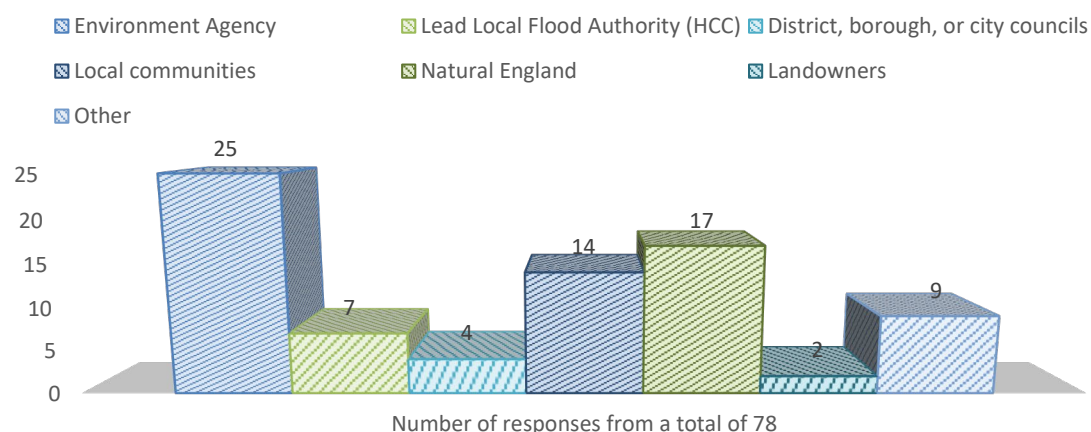


Figure 13: Who should make decisions about implementing NFM measures

Q12. DO YOU HAVE LAND WITHIN THE THE HEADWATERS OF THE RIVER TEST OR ITCHEN (WATERCRESS AND WINTERBOURNE AREA) WHICH COULD BE USED FOR NFM?

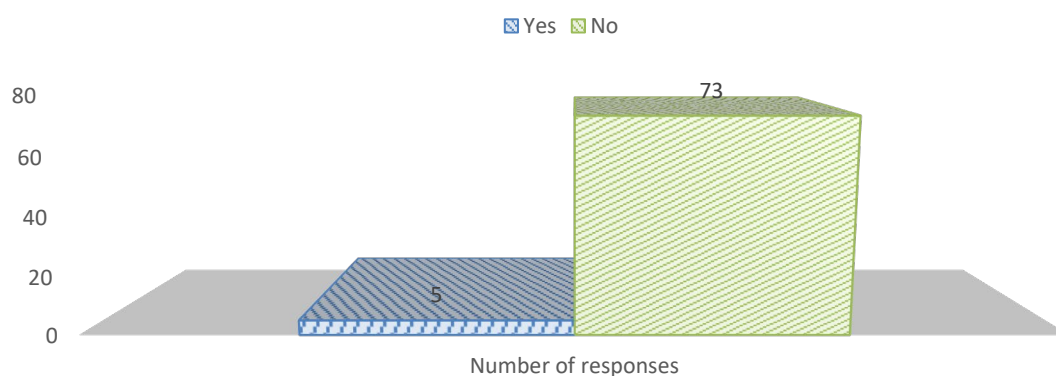


Figure 14: Residents who own land within the River Test or River Itchen headwaters

Q13. WOULD YOU CONSIDER ALLOWING NFM MEASURES TO BE IMPLEMENTED ON YOUR LAND?

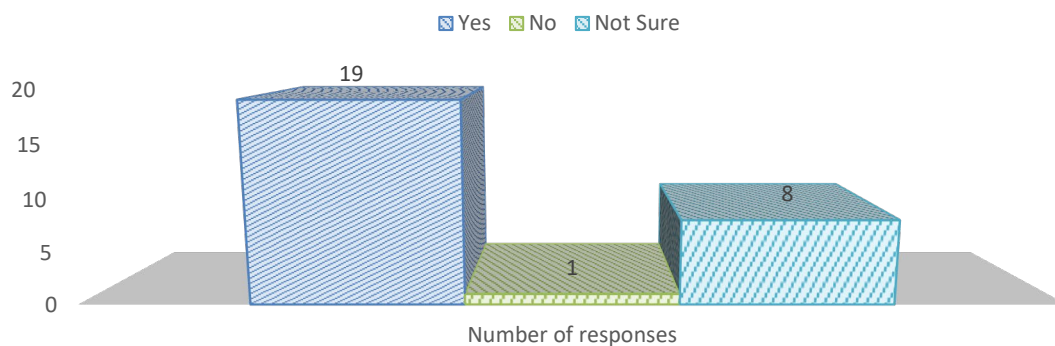


Figure 15: Residents who would consider allowing NFM measures on their land

Q14. WHICH OF THE FOLLOWING WOULD BE A FACTOR IN YOUR DECISION?

- ☒ Increase in biodiversity and wildlife habitat on your land
- ☒ Reduction in flood risk on your land
- ☒ Reduction in flood risk further downstream
- ☒ Availability of funding for implementing NFM measures
- ☒ Availability of insurance cover for NFM measures
- ☒ Availability of information and guidance on implementing NFM measures
- ☒ Evidence of effectiveness of NFM measures
- ☒ Health and safety responsibilities relating to NFM measures
- ☒ Increase in biodiversity and wildlife habitat in wider landscape
- ☒ Legal requirements to explore NFM measures
- ☒ Maintenance responsibilities relating to NFM measures
- ☒ Potential to affect an Environmental Stewardship Agreement or other commitment
- ☒ Protection of heritage features on your land
- ☒ Protection of heritage features in the wider landscape
- ☒ Whether the land could be used for another purpose or not
- ☒ Other (see below)

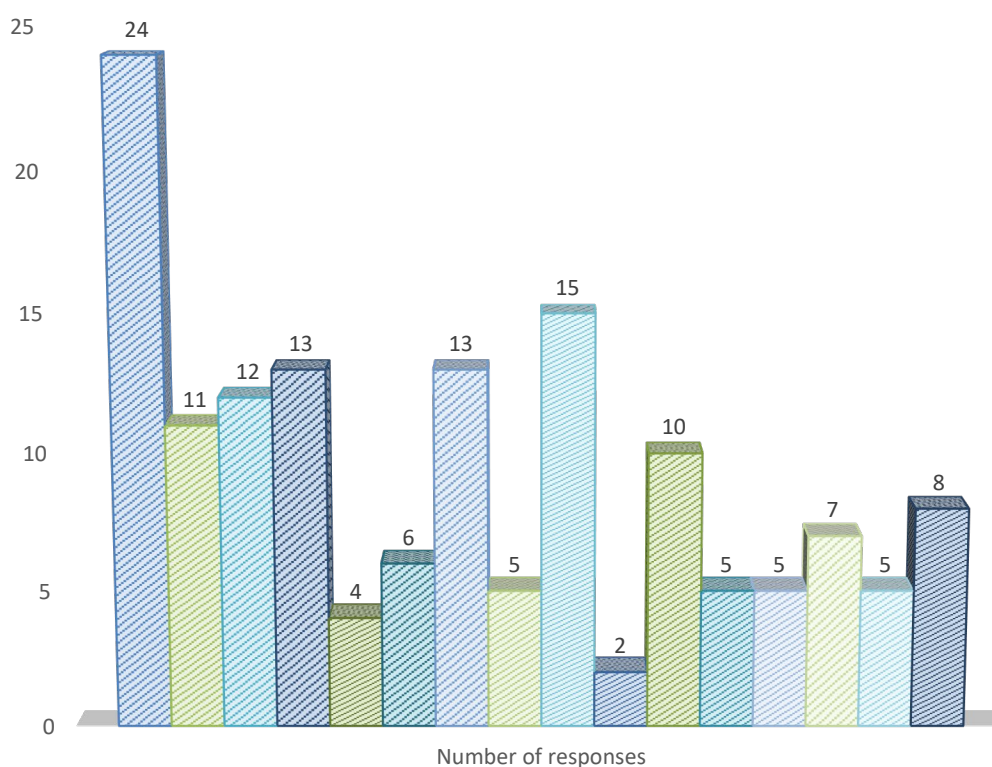


Figure 16: Factors affecting decision making

March 1, 2022

4.1.1 Questionnaire Summary

I was gratified to learn from the questionnaire data that the majority, 68 out of 78 responders think of NFM measures either very positively or positively and 63 out of 78 responders believe that NFM is a suitable method for helping to reduce flood risk in Hampshire. This seems to suggest that overall perception of NFM within this sample is good. However, when the questions became more detailed, other concerns came forward.

Knowledge of NFM techniques varied throughout the group, but some techniques were well understood, those most encountered being:

- **Creating or enhancing wetlands** - 76 responses
- **Returning straightened river/streams to their natural meander** – 67 responses
- **Creating ponds/lakes that are online (connected to rivers/streams)** – 65 responses

The least well known was daylighting of pipes and culverts to return them back to being open watercourses, though this may have been a misunderstanding of the terminology.

The overall feeling surrounding knowledge of and information available on NFM is that it is 'average'. Bearing in mind that the responders to this survey are mostly already working within or connected to the FWM sector, this response should be cause for concern and will be highlighted as a key finding.

The theory of NFM is reasonably well understood within this group (see note below re sampling data) and the majority of replies 59 out of 78 responders, indicated the belief that NFM is a better solution than traditional 'hard engineering' techniques such as walls, barriers and pipes.

67 responders out of the 78 indicated that they would either strongly approve or approve of NFM techniques being used as part of a suite of flood alleviation measures near their own residences. There were many factors mentioned in the making of this decision, the most popular being:

- **A desire to increase biodiversity and wildlife habitat in their immediate environment** – 73 response
- **A desire to reduce flood risk in their immediate environment** – 66 responses
- **A request to see more evidence of the efficacy of NFM techniques** – 55 responses

There seemed to be some uncertainty over roles and responsibilities when it came to the implementation of NFM schemes. This was a recurring theme throughout my research, and again will be picked up as a key finding. The majority of responders associated the County Council/LLFA (30 responses) or the Environment Agency/Environmental organisations (20 responses) with NFM.

However, when asked who should be making decisions re NFM in their area the majority said that it should be either the Environment Agency (25 responses) or Natural England (17 responses) with only 7 responders believing it should be the County Council/LLFA. This indicates confusion of current obligations and liability within the FWM sector.

Those with land who would be willing to consider NFM projects on their land were primarily interested in an opportunity to increase biodiversity and wildlife habitat on their land – 24 responses or in the wider landscape - 15 responses. Legal responsibilities, insurance queries and health and safety issues appeared to be of far less concern with 2, 4 and 5 responses respectively. This was a surprising result as I had expected more concern in this area based on wider discussions.

March 1, 2022

4.2 Results from workshops

On 2nd March 2021 a virtual NFM information and discussion event was held as part of a wider set of activity to improve knowledge and opinions of NFM. This event was part of a work package in the Watercress and Winterbournes project. This project is a Heritage Lottery Funded initiative to improve the headwaters of the Test and Itchen rivers in Hampshire, in which Hampshire County Council is a lead partner. For further information please visit the website - [Watercress and Winterbournes | Hampshire and Isle of Wight Wildlife Trust \(hiwwt.org.uk\)](https://www.hiwwt.org.uk).

As lead officer on the NFM work package, I organised and put together the event in order to be able to gather data on wider perceptions of NFM and to offer knowledge to residents to allay some of their concerns.

Invitations were sent to all community groups involved with the Watercress and Winterbournes project, all Parish Councils in Hampshire, 13 Local Planning Authorities in Hampshire, including the South Downs and New Forest National Parks. A link to the event was also put on the Watercress and Winterbournes website and sent to other local networks, so I cannot be sure exactly how many people the information reached.

The maximum number of participants recorded at the webinar (held online due to Covid-19 restrictions) was 147 and the content included presentations from:

- **Imogen Barnsley** from Natural England
- **Morag Stirling** from the Watercress and Winterbournes project
- **Peter Eden** from the Environment Agency
- **Luke Neil** from CaBa
- **Vicki Westall (Myself)** from Hampshire County Council

Imogen presented on the findings of her recent PhD thesis examining the effectiveness of NFM techniques in chalk catchments. A significant proportion of Hampshire lies on chalk geology and the Test and Itchen rivers are both chalk streams.

Morag presented on the background of the Watercress and Winterbournes project and explained the importance of incorporating NFM into the catchment plan to benefit from the wider benefits including biodiversity enhancements and the benefit to human health.

Peter explained some of the support available to landowners and organisations to aid them in setting up small scale NFM projects in their own communities. This support is provided by the Environment Agency, Lead Local Flood Authorities and regional Flood and Coastal Committees.

Luke Neil from CaBa presented on the importance of using the Catchment Based approach when designing flood alleviation schemes. The catchment-based approach demonstrates the importance of using the whole river basin catchment when working with NFM. It uses natural boundaries such as hills and geology rather than administrative boundaries which divide the county into boroughs or districts.

I presented on the subject of Hampshire County Council's responsibilities and the re-launch of our Local Flood and Water management strategy which focuses on holistic water stewardship, NFM and the catchment-based strategy where practical within Hampshire.

After the presentations there was a question-and-answer session followed by an open forum to allow participants to discuss issues of interest with the experts and other visitors. The following excerpts have been taken from those questions/comments.

Comments from offline conversations and online questions and chats have been anonymised in order to protect participants. Though permission was sought to use comments in this report. Examination of answers

March 1, 2022

was undertaken and grouped under headings summarising what are perceived to be the most common barriers to NFM.

- **Effectiveness or importance of NFM vs traditional engineering techniques**

Several people I spoke with or engaged in an online 'chat' with had a clear perception of the relative importance of environmental issues. For example, one residents' association chair remarked, *"Is this all not just all a bit green and fluffy?"*

I spoke to a retired engineer who was very keen to point out how long they had been working in drainage and their thorough understanding of pipes and gullies. Their perception based on their training and career was that reducing flood risk was all about getting water into pipes and getting away as fast as possible, regardless of the fact that this may increase flood risk elsewhere.

One particular attendee who had undertaken drainage works on their land approximately a decade ago explained that concrete pipes were used as that was what had been recommended by the drainage engineer. This is an example of perception being swayed by the opinions of others who may be seen as 'experts' within a field of study. Rather than undertaking research which may highlight more recent thinking or methods in the field of water management, landowners rely on 'experts' who use traditional methods as 'that is what they have always done.'

As with other participants involved in the research, those who attended the event were concerned at the lack of evidence and monitoring data which could demonstrate a reduction of flood risk following the implementation of NFM measures, particularly in Hampshire.

- **Sacrifice of land which could be used for other purposes**

Several landowners at the event pointed out that funding and support from the government in some forms depend on how much of their land is given over to productive agricultural use such as animal grazing or crop growing. Concerns were raised that if land was being used instead for water attenuation or potential flood storage this funding could be lost and how would they be compensated.

- **Perception of local government and 'red tape'**

Concerns were raised by participants as to the amount of bureaucracy involved in the process of setting up NFM schemes and the overall perception of local government's ability to manage such projects. Comments such as:

- *"You need a licence for this and permission for that it's so much hassle!"*
- *"And when it doesn't work and we flood anyway, you'll have wasted more of my money, and that's a truth!"*

It is interesting to note that here that the perception of local government or political institutions as a whole has been overlaid onto a technique, such as NFM, and has changed the perception of the method, due to the participant's view of the County Council. It would be extremely interesting to investigate whether this perception would continue if the projects were seen to be being managed by private companies.

- **Funding**

Lengthy discussions were held on the subject of available funding, ongoing costs and the processes for applying for such support. It was also pointed out by some that certain funding streams seemed to be in direct contention with each other, such as farming grants being available to use land for agriculture which would be

March 1, 2022

lost if applying for NFM grants. This could also be thought of as a negative perception of bureaucracy and could, therefore, be included in the above paragraph.

- **Knowledge**

Participants were quite happy to admit that their knowledge of NFM measures and exactly how they worked was, in many cases, a little hazy. Discussions were held expressing the importance of ensuring that a suite of measures are considered for a catchment, and how there is no NFM measure which is a 'one size fits all' solution. As can be observed from the results graphs above, knowledge of NFM techniques changes significantly as you move through the different methods, indicating that wider information needs to be made available about all techniques.

A very interesting point highlighted through these discussions was the role that popular culture plays in the formation of perception. The catchment-based approach presentation from Luke prompted a discussion about the re-introduction of beavers onto rivers and watercourses in order for them to create leaky dams which would slow water flow and reduce flooding downstream.

A member of the Salmon and Trout conservancy voiced their worry that the re-introduction of beavers would have a significant detrimental effect on the fish population of the rivers as the beavers would hunt and eat them. This is a common misconception when it comes to water-based mammals. Beavers are, in fact, completely vegetarian their diet being made up of '*aquatic plants and grasses, as well as the bark, twigs and leaves of trees*' (Woodland Trust 2020).

When asked how the participant came to form this perception, they answered that they had read it somewhere as a child. Perhaps the line '*Children and beavers worked together to prepare a simple and delicious meal of fish and potatoes. The children are famished, so they eat with gusto*' (Lewis.C.S, *The Lion, the Witch and the Wardrobe*, 1950) or when Mr Beaver sat next to the ice hole until he "*whisked out a beautiful trout*". (Lewis.C.S, *The Lion, the Witch and the Wardrobe*, 1950). This is an example of people's perception being swayed by popular culture as an external stimulus.

4.2.1 Workshop Summary

I was pleased to have reached a significant number of people with information regarding NFM and hopefully worked towards starting to change a couple of the more negative perceptions of NFM in Hampshire.

Though I have concentrated on some of the more interesting or contentious comments made during the event, as these are more interesting in the field of how perceptions are created, I was gratified to hear that, in general, the principle of NFM was supported by the majority of participants who raised questions or entered into discussion. It is, however, obvious, that it is when it gets to the specifics of where these projects could be based, who will be responsible and who will pay, that concerns begin to be raised.

This in general reflects the overall findings from the questionnaires, however more concerns were raised at the event and there were more negative comments. I believe this can be attributed to a wider audience where the overall knowledge of and interaction with NFM techniques was lower than of those who responded to the questionnaires.

4.3 Results from Interviews

The interviews I undertook with senior officers/decision makers within Hampshire County Council gleaned some extremely interesting conversations resulting in wider discussions of subjects which I had not considered when considering this report or included in my hypothesis.

It also became very clear during the course of undertaking these interviews, that the perceptions of those involved are heavily influenced and shaped by the area of work that they are involved in. For example, those working with HCC land and tenant farmers will be heavily swayed by issues experienced by farmers whilst team leads may be more concerned with costs and financial issues.

This can make it hard to ascertain individuals' personal perceptions on NFM as the issues associated with their work areas are, obviously, more significant in this context.

4.3.1 Summary of interviews

4.3.1.1 Stuart Jarvis

Stuart Jarvis is the Director of the Economy, Transport and Environment (ETE) department at Hampshire County Council. His role encompasses overseeing many different practises with varying viewpoints of flood risk management including highway drainage management, strategic planning, environmental concerns and strategic water management. He is fully involved in discussions around the subject and is very aware of the fact that there are a variety of barriers, acknowledging during the interview that *"Some of them are policy, some are legislative and some are financial."*

I have summarised the relevant comments and observations below under sub-headings of each perceived issue:

- **Cost**

"There are other benefits that derive from NFM schemes and therefore the trick is to go after the funding schemes that are addressing some of the wider benefits"

"There has got to be something around how do you compensate the landowners"

"It is going to cost someone a lot of money and someone is going to have to underwrite some quite serious legal obligations. So, I think there is a whole lot of stuff around that, I think it would be interesting to explore if the lead local flood authority could find a way in which it took the obligations on or underwrote the obligations on landowners."

As a department director, Stuart is, understandably concerned about how NFM schemes will be funded and how landowners will be compensated for the sacrifice of their land. He makes a very good point about funding streams, pointing out that if NFM not only benefits the flood and water management sector, but also mental and physical health; ecology and biodiversity and climate change, could other funding streams not be gleaned from these sectors?

- **Efficacy and lack of best practise examples**

"It's interesting that nothing has happened despite it being four years on and lots of people said "Oh, that's a really good idea" and yet we haven't seen any evidence of any of it happening"

*"If we can actually **do** things, that create new habitat... and the creation of up catchment storage, slowing down."*

March 1, 2022

“We need some exemplars.”

Again, Stuart is looking at this from Hampshire County Council’s point of view as he is heavily influenced by the political landscape. He fully understands that the organisation cannot be seen to be taking risks with public money and investing in projects which have little evidence to prove that they would improve the lives of Hampshire residents by reducing flood risk.

- **Responsibility**

“How do you kind of guarantee that it is maintained, who manages it if it does start to fill up with water because then it becomes a risk.”

This is one of the biggest areas that recurs throughout this research. Landowners, organisations and local residents are all very concerned about who will be responsible for these features if they fail and who will take on the ongoing maintenance of structures to ensure they continue to function effectively.

- **Bureaucracy**

“At what point does a BUND become a reservoir or a dam for legislative purposes, imposing very significant costs and obligations on the landowner, to maintain and have regular inspections on the thing under the reservoir Acts and all that.”

The bureaucracy and legislation involved within the Flood and Water Management sector can be seen as a barrier within itself. Residents and landowners are concerned with the amount of ‘form-filling’ and ‘red tape’ involved with applying for funding and project permissions. Officers working within the sector are likewise concerned with paperwork. However, the issues encountered by the officers are more to do with legislation and responsibility captured in the Land Drainage Act 1991 and the Flood and Water Management Act 2010, as demonstrated by Stuart’s comment above.

4.3.1.2 Councillor Rob Humby

Councillor Rob Humby is the Deputy Leader of Hampshire County Council and Executive Member for Economy, Transport and Environment at Hampshire County Council, he is involved in an extremely wide portfolio and array of works which can overlap with flood risk management. One of his main roles is communicating with members of the public and ensuring Hampshire residents that the County Council is undertaking its remit and fulfilling its responsibilities.

Rob’s over-riding thoughts on barriers to initiating NFM projects, and other schemes within the Council, is the importance of partnership working and the channelling of knowledge and communication. However, he also acknowledges how hard this can be due to the bureaucracy involved.

I have summarised the relevant comments and observations below under sub-headings of each perceived issue:

- **Cost**

“There are enormous subsidies to the NHS, therefore, should some of that funding go toward doing some of the projects and programmes like this as well. But we are all focused individually on our silos, on our budgets, as we have to make our budgets balance at the end of the year”.

“The biggest thing for me is about partnerships and with partnerships working”.

March 1, 2022

Rob is echoing Stuart's comments here with regard to how projects can be funded and the potential for funding schemes from multiple funding sources including the NHS and environmental funding streams. He is very aware that, in his position, he has to ensure that public money is used appropriately and how this can be achieved with partnership working.

- **Knowledge**

"One of my biggest things with the County is about communications and perception. This is going to sound weird, but it is the reality from that point of view. No matter what you are doing, if the perception is that you are not, or even if you are doing things where perception is the barrier, then our job is to change how we handle that comms message."

"We need to bring the outside in and show people what we do in here, as the perception now is that this is all we are doing".

"It doesn't matter how much evidence you have that this is the right thing to do, if we don't put that message out in the correct way, it will be deemed that you are just there trying to be obstructive as opposed to quite the opposite."

Rob is highlighting some interesting points here covering several issues. Firstly, he understands that residents require more up to date and exemplar information to inform their decisions and steer their perception of NFM. However, his greater point is to do with knowledge of Council activities and the perception that that can produce.

So, essentially, he is saying that we, as a County Council, need to improve our communications and continue to be as transparent as possible when undertaking works to ensure that perceptions of local government, which may have been gleaned over many years, can start to be improved.

- **Bureaucracy**

"I sometimes think that people think, that I come to the office every day to try and make their lives as difficult as possible."

"I think a wall goes up when people instantly say, well it's their fault, they must change. If that attitude were a bit different, how can we work with you to improve, you might get a different answer."

Again, Rob is very aware, as he should be, of the reputation of political institutions and the difficulty of trying to persuade the public that officers and members of staff genuinely are trying to help residents. However, as a wider comment, as mentioned earlier in this report, is the acknowledgement that some processes involved in applying for funding and permissions for schemes such as this can be laborious and complicated.

4.3.1.3 Steve Clow, Felicity Roe and Roseanne Salt

Felicity Roe is the Director of Culture, Community and Business Services (CCBS) Steve Clow is the Assistant Director of Property Services; and Roseanne Salt is a Senior Rural Estates Surveyor, all based at Hampshire County Council.

These three officers work in a different area of the Council to those in ETE, and this is reflected in their answers, their perceptions of and concerns regarding NFM are focussed much more on the issues for land, wildlife and landowners. However, overriding factors of cost and responsibility are still very much apparent.

March 1, 2022

I have summarised the relevant comments and observations below under sub-headings of each perceived issue:

- **Cost**

FR: *"Social amenities, who is going to pay for it, where is all this money coming from"*

SC: *"Compensation for farmers and landowners for the reduction in value of the land, the reduction in the farmable area, the usability of it, their crop loss etc."*

SC: *"If there is a business case for it and no-one is going to be unduly put out by having to do extra maintenance of areas, for no return."*

As a cross-cutting theme of this document, both capital and revenue costs of NFM schemes was an area perceived by these responders to be an issue. Again, the idea of multiple benefits only being funded by one source (NFM) was discussed along with the loss of income for farmers and landowners. Steve was concerned about ongoing maintenance costs falling to the Council as landowners or LLFA.

- **Knowledge**

FR: *"I think there is a lack of understanding of what happens under the ground in certain parts of Hampshire."*

FR: *"Public perception and concerns before the facts are known"*

RS: *"Did you know that certain species of birds nest there. If you re-route the footpath, you might damage that. Did you know that there is a bit of archaeology buried there that needs protecting, did you know that that is MOD land, did you know there are services there?"* (This quote is also relevant to the below issue of other land use)

Knowledge of the practicalities of initiating schemes such as these is highlighted here as being an issue. There seems to be a perception from members of the public that organisations who are championing these schemes do not have the relevant knowledge of the areas in question. This can include residents questioning if different departments within the Council communicate with each other re services which may already be installed underground or biodiversity which lives in the area.

- **Other Land Use**

FR: *"But there is a challenge, which is the same challenge that we have in relation to land development. There will be conflicts between developers and regulators".*

SC: *"Reduction in the land value, both from an agricultural perspective, if I know that field is going to be an attenuation pond and, in theory, flood once every five years, but in fact it could happen more. Do I bother cropping it or will I just lose the crops?"*

This point is a good reflection of the interviewees. The three officers being interviewed here all work within CCBS. This is the department which is primarily working with HCC's own land holdings and farmers/landowners based in Hampshire. It is therefore easy to understand why their perception of issues includes concerns from landowners questioning how they will be compensated for land loss which could be used for crops or sold for development.

- **Responsibility**

FR: *"Because my service had to pick up the pieces when the bridge flooded the first time round and the also when it happened the second time round."*

SC: *"The cost and responsibility for any on-going management of newly created areas".*

SC: *"There was a safety aspect too. If we have a pond there, right next to a main road. What happen if kids want to go jumping in there and things. Do we have to fence it off and who is responsible for maintaining that fence? Who is taking on that risk?"*

SC: *"It's yet another pressure on green and agricultural land to deliver benefits other than food and access to the countryside."*

Responsibility of assets, health and safety issues connected with them and ongoing maintenance to ensure future functionality are large areas of concern for the organisations looking into implementing NFM projects. These officers seem to be aware that landowners will not be in a position to take on these liabilities and are therefore wary about committing to them without sufficient guidance.

4.3.2 Interview Summary

Several key themes emerged again when conducting the interviews which supported other data gathered and consolidated some of my thoughts relating to the original hypothesis and potential conclusions. I have summarised these along with the other data in section 5.4 of this report.

5.0 Key Findings

The following chapter summarises the data collected into key findings from the study, noting any anomalies or issues with the data.

5.1 Sampling Bias

It is worth noting at this point that many of the findings from the research undertaken reflect the role/priorities of those interviewed/responding to questions. For example, those working within the bioiversity sector seemed more interested/concerned with the effects NFM can have on the ecological habitat status of the surrounding area, whilst directors of departments were, understandably, more concerned about costs.

It is also worthe re-iterating that the majority of respondees are already somewhat involved in the water management or NFM sectors, whether as a local landowner, FWM professional or an individual with interests in the water quality of Hampshire. Therefore, it is extremely likely that these results are displaying some significant sampling bias.

It has also been noted that these meetings and information events may be 'preaching to the converted', as those members of the public who respond to or attend these events are those that have an interest in the subject and are therefore more informed and aware of the subject matter than others.

In order to avoid these sampling biases, a much larger and wider investigation would have to be undertaken, for a longer period with appropriate incentives offered for responding to the questionnaires. Unfortunately, this was not possible within the confines of this dissertation.

5.2 Key Finding Themes

Overall I found I was able to group the findings from the data collected into six distinct groups or themes, those concerned with:

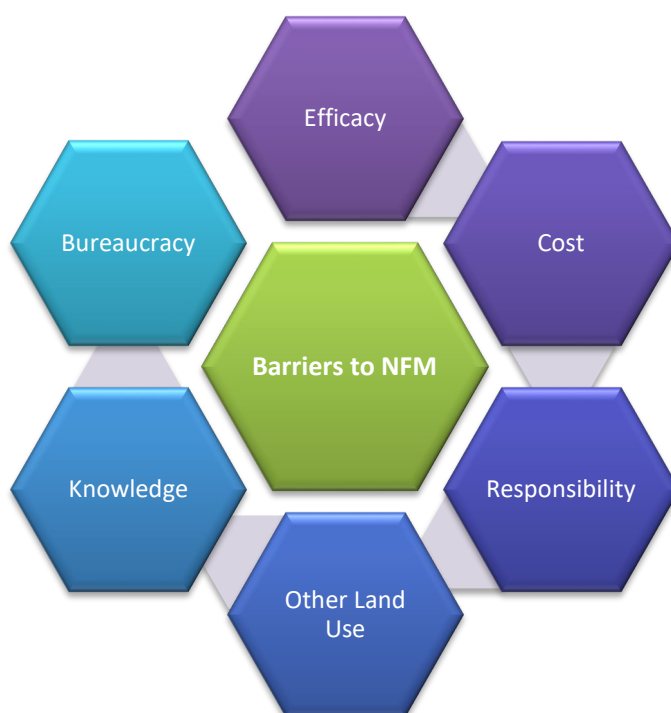


Figure 17: Key themes of barriers to NFM

- **Efficacy**
 - A lack of exemplars or best practise examples of NFM
 - A lack of monitoring data demonstrating reduced flood risk following NFM interventions
 - A belief that some hard engineering techniques are more effective gleaned from perceived 'experts' and popular culture
- **Cost**
 - Concern over who is responsible for paying for capital construction costs
 - Confusion over the availability of funding streams
 - Concern over how ongoing revenue costs such as maintenance will be covered in the future
- **Responsibility**
 - Who should take responsibility if flooding occurs following NFM implementation
 - Who is liable should injury occur which can be traced back to a NFM asset
 - Should there be legal obligations on landowners or other organisations to undertake NFM works
 - Which organisations should be involved or tasked with making decisions
- **Other Land Use**
 - Concerns over farmers giving up land which could be used for agriculture/grazing
 - Belief that land could be worth more if sold for development rather than being used for NFM measures
 - Queries over how landowners will be compensated if crops/income is lost due to flood water
- **Knowledge**
 - Popular culture, including films and books, perpetuating the idea that large engineered structures provide better protection from floods
 - Perceived 'experts' in the field of drainage and engineering steering others' perceptions
 - A lack of guidance on or best practise examples of NFM (linked to **efficacy**)
 - A lack of research into and monitoring NFM projects particularly in chalk catchments
 - A perceived disconnect between the concept of 'drainage' and the concept of 'water management'
- **Bureaucracy**
 - A view that there is 'too much red tape' to undertake the process of applying for funding or permission for schemes
 - A view that political institutions including County Councils have spent money on unsuccessful projects in the past
 - Misconceptions on how long it takes to undertake primary research and feasibility studies for such schemes.

5.3 Key Findings Summary

The study revealed that the majority of the key findings discovered were somewhat expected, and fitted in generally well with the original hypothesis stated at the beginning of this report. The majority of people who interacted with the project, through either interviews, partaking in discussions at the event or responding to the questionnaires, expressed some concern regarding the efficacy of NFM methods and the lack of evidence of successful NFM projects in the UK.

Therefore, it would appear that the majority of the responders are happy with theory of NFM and can appreciate the wider benefits of NFM techniques as opposed to 'hard' engineering. However, it also appears that those same responders become a little more wary if schemes are proposed on their own land, citing loss of income or increased responsibility, or if they envisage a significant amount of paperwork and 'red tape' should they pursue such a scheme.

Another large area of concern expressed by a significant percentage of the participants was that of who should take these projects forward, who would be the overall responsible partner and who would shoulder the majority of the costs, both capital construction costs and longer term revenue costs including maintenance. There seem to be a 'grey area' here, with little agreement on which authorities or organisations should 'own' these projects and champion them to ensure they are taken forward to implementation. This is reflected by the difference of opinion about which organisations should be involved as opposed to which authorities should be tasked with making decisions, and therefore, presumably taking responsibility.

There were some interesting points raised which I had not envisaged including the role that popular culture plays in forming people's perceptions of water management. External stimuli such as films, TV shows and children's fiction can place ideas about physical structures and animal behaviour etc which stay with us for a significant amount of time and effect opinions formed much later in life.

I was also surprised that the perception that hard engineering techniques, and the opinions of so-called 'experts' ie drainage and highway engineers, played a much smaller role in forming people's opinions than I had previously suspected. I have experienced a significant amount of this perception in my role. However, through this research I accept that this view is swayed by the careers and knowledge of my colleagues within engineering and highway infrastructure.

Knowledge of NFM continues to be a significant barrier, both available information on how schemes function, but also, and more importantly according to the data, evidence of successful schemes supported by monitoring data which demonstrates reduction in flood risk.

Perception of political organisations as a whole, including County Councils, also plays a significant role here. Though I was aware of this subject area at the start of this dissertation, and was wary of it being out of scope, it would have been impossible to answer the questions set out at the beginning of this report without investigating a little into how people view local authorities and their role. Unfortunately, local government organisations do not also enjoy the best of reputations with residents. This, coupled with austerity measures and funding cuts over the past decade have had a significant effect on peoples' perception of Council led initiatives.

6.0 Conclusion

Flooding is an incredibly emotive subject involving harm to both physical and mental health, loss of life and belongings, the ruination of homes and relationships along with rising costs across the board. Therefore, it is hardly surprising that this topic is regarded with a healthy amount of scepticism and concern and people are wary of changing what they see to be 'tried and tested methods'.

However, this research has shown that the concerns over NFM are actually much more based in the practicalities of such schemes. With the onset of visible effects of Climate Change starting to change people's minds, many Hampshire residents are beginning to realise the need for wider, more strategic plans to reduce flood risk and increase resilience of communities, including the use of NFM.

Although the theory of NFM appears in general to be reasonably popular across the people interacted with during this project, it is when these theories start to form themselves into potential projects and the practicalities of the situation become apparent that worries begin to surface and support for schemes begins to waiver, so this is where resource needs to be focussed to support potential schemes and start to steer perceptions to a more positive stance.

In conclusion, I have gone back to the original questions that I stated that this report would answer at the beginning of this process. These being:

- What do people perceive the barriers to NFM to be?
- How and why have people formed these perceptions?
- How can we, as a political organisation with certain powers, begin to change people's minds?

What do people perceive the barriers to NFM to be?

As shown above, the perceived barriers to NFM can be broken down into 6 themes:

- **Efficacy**
- **Cost**
- **Responsibility**
- **Other Land Use**
- **Knowledge**
- **Bureaucracy**

How and why have people formed these perceptions?

'Bad experience and bad information results in faulty perceptions. Faulty perceptions will then lead to misdirection and disconnection'. (Blount, Richard, Healing America, 2021)

Perceptions discovered through this research and discussed in this report have been formed in several ways including:

- Inaccurate external stimuli such as media and fiction
- Bad personal experience of complicated bureaucracy and processes
- Lack of knowledge of subject matter
- A lack of positive external stimuli such as examples and results
- Wider concerns over cost and responsibility

March 1, 2022

How can we, as a political organisation with certain powers, begin to change people's minds?

Practical actions that can be taken to achieve this include:

- **Communications** The Council should endeavour to improve information available on NFM schemes and publicly support potential NFM schemes within Hampshire. Support for such schemes should be written into public documents such as strategy and policy going forward.
- **Cost** Council powers and members should be used to lobby government to ensure projects are funded fairly across a wider proportion of sectors including health, development and planning, ecology and biodiversity. Support should be given to groups applying for funding to ensure bids are successful.
- **Provide practical support** in the form of pre-application advice to potential applicants to aid in understanding the required permits and permissions, reduce the amount of 'red tape' encountered and increase knowledge of the legalities involved in NFM.
- **Work in partnership** with other organisations, including the Environment Agency, the National Farmers' Union, Natural England etc to ensure appropriate compensation is available to land users. This will also reduce the burden on individuals having to work in collaboration with such a wide variety of organisations.

Based on this research, I have found that rather than trying to persuade people that the concept NFM is a strong potential method to reduce flood risk, as it appears the majority are already convinced by this argument, that as an authority we need to concentrate on increasing knowledge and helping practically to get successful NFM schemes implemented. This will improve perceptions and therefore support and uptake of NFM schemes in Hampshire.

March 1, 2022

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Local Government Association [Perceptions: The fact and fiction of trust and satisfaction | Local Government Association](#)

Natural Flood Management Toolbox: a 7 step guide to developing NFM schemes

Public perceptions of local authority regulatory service – Ipsos Mori

March 1, 2022

Appendix A

Interview with Stuart Jarvis, Director of Economy, Transport and Environment, Hampshire County Council

VW: Good Morning, Stuart. Thank you very much for agreeing to speak with me today. As I explained in my e-mail I am undertaking research for my Masters Dissertation, '*A study of stakeholders' perceptions of Natural Flood Management and how this affects uptake across Hampshire*'. I am working with the Test and Itchen Catchment Partnership on the Watercress and Winterbournes project also, so I intend this report to be of use to all of us. The chunks I would like to do as outputs for the project for Hampshire are, training courses for internal colleagues in Highways and Countryside but also externally for LPAs, developers and contractors.

SJ: And farmers?

VW: Yes. Landowners, and I am also going to be speaking to other members of CMT [Corporate Management Team] like Jo Heath and Felicity Roe and people, about the potential of using Hampshire County Council land for Natural Flood Management [NFM] schemes as well. So, hopefully, I am going to try and pull all those streams together.

SJ: Yes, That's a good idea.

VW: Obviously, you will end up with a report, which will be my dissertation, which will be on what people are perceiving the barriers to NFM to be and that is hopefully what we could take forward too. Hopefully steering some statements and policy guidance in the local flood risk management strategy.

SJ: Yes, I agree with that. I was going to ask you about that, as I am very keen that our Hampshire flood management scheme should not just be a prescription for the updated flood maps of the Environment Agency. I think there is a policy framework in there, that begins to, in absence of anything else, set out our priorities and our approaches as the LLFA.

VW: Yes, absolutely, and unfortunately, I think some strategies have been like that in the past, out of necessity, because there was not a lot of money there.

SJ: Yes, because that's the only way we got the money, but given the proportion of flood defence funding that's coming nationally, particularly small rural schemes, if we don't get any grants it's not going to make a lot of difference now.

VW: Yes, Exactly. So from a NFM point of view, I am working with a Ph.D student who is working on hard evidence, she's outside in the rain doing scientific things where I am sitting inside in the warm, looking at it from the other side, which I am happy with.

SJ: Yes, I've always thought of you as leadership material.

VW: Thanks. It's particularly a problem in Hampshire as we are 60% chalk and a lot of NFM techniques rely on surface water rather than ground water flooding, so there is a lot of work to be done there. So, I appreciate that evidence is one area that is quite a big barrier. Another is funding, we have already touched on it. We are very rural and we don't have vast amounts of rural very vulnerable communities, so it's difficult for us to make things stack up to get the funding.

March 1, 2022

- SJ: Yes, if it's just about protection of property and life funding, I think the trick is what you were saying earlier, that there are other benefits that derive from NFM schemes and therefore the trick is to go after the funding schemes that are addressing some of the wider benefits rather than necessarily rather than just the dedicate flood management stuff.
- VW: Yes, exactly. That's very true. I think that's a funding trick across the whole spectrum. You will be aware that there has been a lot of steer over the 12 months, from central government and European government, things like the 25year environment plan, things like the changes to national planning guidance and there seems to be this steer towards NFM and SUDS and working with natural processes, but I will be really interested to get your opinion on what you think we should be doing Hampshire level wide. Some of the barriers I have come up with are obviously responsibility, adoption and maintenance long term. Who is responsible if something floods, is the land owner going to end up with a several million pound bill. Also, internally, I come against a lot of "This is always the way we have done it". There is a lot of traditional drainage technique engineers around that say "we put it in pipes and it goes underground and that's what we do". I just wondered if you have any opinions on that, or anything useful that we could be doing to dissuade this.
- SJ: Yes, OK. Let's talk about it. I mean, at the beginning, sometimes I think pipe in the ground is probably the appropriate answer and there are real issues about adoption of stuff and everything and I kind of understand that. I suppose, Vicki, that one of the biggest challenges that I perceive, from where I sit, is that government policy guidance, funding streams and initiatives are all directed at either new developments or at all known property danger flood stuff. So coastal ingress is a huge problem for the developed coast between Havant and Fareham and the New Forest coast. It's about big cuts and rather than about the bigger thing. So, some of the trick is, again you know most of this stuff, better than I do, stuff about upstream management and there's some stuff about being proactive about flood attenuation and flood management, which has got nothing to do, necessarily, with the immediate issues of proposed local plan allocation for more housing sites. I have had conversations with Roy [Leader of the Council and Romsey resident] in the past, for example, that the best flood defence scheme for Romsey is probably some stuff that slows the water in the Test tributaries in up in the north of the Test valley and across into Basingstoke, rather than build a wall around Romsey, by the time you get to a wall around Romsey, that should really be the last resort.
- VW: Yes, exactly.
- SJ: Which I think, intellectually is fine, so my challenge is almost that, I think that there is something about the attenuation of flooding events as well. I live in King's Sombourne, so the Winterbourne, quite a significant flooding event, the last time we had ground water problems, several houses flooded out and people had to move out and all the rest of it and it seemed to me at that moment that there were two kind of things that you could do. One was that you want to slow the water down getting into the Test in the first place, because that kind of helps to relieve the pressure on Romsey and so on and the other thing is, how do you protect the village. I know this is a heretical thing to say, it's a bit like traffic, you either bypass or you orderly halt traffic to pass through the urban area in a controlled way. So, the Bourne has limited capacity in King's Sombourne and can carry a capacity of so many metres per second, or whatever it may be, before you start overtopping some of the footbridges or the banks. Then you flood the road, it goes into people's houses and disaster. So, I am really interested in whether you could do some landscape modelling on some of the agricultural land, upstream of the village to actually create lagoons, at a time of exceptional flow.
- VW: So, sort of offline storage areas.
- SJ: Yes, but we are talking about BUNDS with the possibility of sluice control rather than creating a dam and always having water in it, because the Winterbourne is dry most of the time and the upstream bit of it doesn't ever have any water in it, except when we get to really high ground water events.

- VW: Yes and I think that is one of the perceived issues, that we say we are going to create these offline storage areas almost in new developments, areas that are designed to flood and which can also be green leisure areas that can be used, but people say “what is the point of having a children’s playpark if it’s always going to be under water”. It’s about getting the point over, that it might be under water once every four or five years, for three or four days.
- SJ: Yes, exactly, and the ecological potential of having that. We are back into the old flood meadows issues, aren’t we? For me, some of the trick around that is, and it’s interesting that nothing has happened despite it being four years on and lots of people said “Oh, that’s a really good idea” and yet we haven’t seen any evidence of any of it happening. There has got to be something around how do you compensate the landowners for allowing that to happen in the first place. How do you kind of guarantee that it is maintained, who manages it if it does start to fill up with water because then there are legislative blocks. At what point does a BUND become a reservoir or a dam for legislative purposes, imposing very significant costs and obligations on the landowner, to maintain and have regular inspections on the thing under the reservoir Acts and all that.
- VW: Yes, which is exactly what has just happened at Durngate [a Flood Alleviation scheme in Winchester in the River Itchen] because they have come to the point that if it’s 1 in 100 plus, it will technically be a reservoir, but it will only be that for a week every 15 years or whatever.
- SJ: Exactly, and in the meantime, it is going to cost someone a lot of money and someone is going to have to underwrite some quite serious legal obligations. So, I think there is a whole lot of stuff around that, I think it would be interesting to explore if the lead local flood authority could find a way in which it took the obligations on or underwrote the obligations on the landowners. I think it’s an interesting concept, that rather than spend a lot of money on engineering measures, it may be that we should explore other ways in which we could negotiate an insurance policy with the insurance industry that underwrote the landowner obligations on structures on the flood asset register. So, if we listed these structures under our obligations to list or record them on our flood management assets register. If it’s on that register, can we offer some sort of pooled insurance.
- VW: That would be a huge enabler, I think, for landowners to get more involved.
- SJ: Yes, that’s my view. Unless, we have got something like that on the table, it’s going to be very, very difficult for us to get involved or do we just try to acquire those things and then just license them back to the landowners.
- VW: Yes, that is a question that I would ask or is it time for us to adopt some of these things and maintaining them and working that out. The whole adoption body still hasn’t happened, it’s still a huge area of confusion for people from small SUDS assets right up to whole schemes.
- SJ: Yes, exactly. But there may be commercial potential in that because, if we are moving more into the SUDS territory, you have your routine maintenance operations that would have to be carried out, so there is a potential income source and a potential to employ a workforce that is dedicated to doing that kind of stuff. That may be a commercial opportunity for the Countryside service who do that kind of work on other open land management things.
- VW: It’s not like we don’t have the skills on board.
- SJ: Equally, it may be something that a DLO in a district council could pick up as a way of broadening their income base to make their DLO operations more sustainable into the future.

- VW: Yes, that's really interesting and it's what it's all about, trying to get some enablers for the future. That these are the kind of things we could do to get across these barriers. This is where Firefly has been particularly good for me. People say that you are quite good at presenting and you've presented it really well and someone could be sold about 90% on an idea but if that 10% is still niggling and you haven't addressed that, then they are going to say "No, I'm not interested ". So, you have to try and find out what different audiences are worried about.
- SJ: Exactly, I absolutely agree with you. So, in a way, I think that the intellectual battle has already been won. Now it's about the hints of reality, it's what you were saying at the beginning about the constraints, some of them are policy, some are legislative and some are financial. Maybe the lead local flood authority role needs to morph into some that. I wouldn't be very good at my job if I didn't say to you that the pressure on the budgets for the local authority, particularly for our services is immense. So, the idea of taking on new obligations is a daunting one and relying on Government funding for this is a complete non-starter in my view. So, one would have to find some way to create a local funding model, that was sustainable without needing the injection of Government funding. For this, I am talking about maintenance and management, not necessarily about doing the interventions in the first place. So, the land modelling to create the BUNDS and that, would be done through normal capital funding. That, I don't think is a problem. The problem is how do you manage and maintain them. This is where I think there may be an interesting conversation with the insurance industry. Could we possibly have something like a bond issue to raise a subscription for it. Could there be a levy as part of the Council Tax. Could the Government allow some flexibility around that, to take part of the Council Tax, you could raise Council Tax by half a percent to create a levy as long as it was hypothecated into a fund to be used for those purposes.
- VW: That's really interesting. I'd thought very much about the adoption issue and taking on responsibility, but not working with the insurance industry to say we will underwrite them and take the responsibility because I think the responsibility issue is a big one. We can talk about ourselves as landowners but separate landowners are worried about the responsibility and the maintenance. Also, we have talked a lot about storage upstream but some people have the attitude "Well, what's in it for me, I'm not going to flood, that's people downstream. So why should I give up my land"
- SJ: Yes. That's why I was wondering about some sort of special levy that could be applied in that. May be it should be part of the water industry's levy and may be they should pay us for the management of surface water attenuation.
- VW: That's really interesting.
- SJ: I don't know the answers but I think there are some conversations to be had around some of these things.
- VW: Absolutely. In the long term, I would like to come up with some answers and actions and things. But it's really interesting to talk to people, depending on where they are in the organization and external, as to what they see to be perceived as the biggest barriers to what people could be doing to overcome some of those and increase uptake. Four years on, all the ideas are right and everyone wants to be involved, but it's the minutiae of actually making it happen on the down on the ground that's holding things back.
- SJ: Yes, and we need some exemplars.
- VW: Yes, we do.
- SJ: So, the next thing to do would be some sort of pathfinder type of approach and do an exemplar, so taking one of the Test tributaries and applying some of this stuff. We also talked earlier about looking at the sources of funding that are attached to the full benefits rather than just the flood attenuation. If we can actually do

things, that create new habitat, could we use the replacement of common agricultural policy funding to fund the creation of up catchment storage, slowing down. You will be far more familiar than I am with all this stuff, with some of the things that have been done in the New Forest, with the streams to slow the streams down and recreate the meanders and everything.

VW: Another re-meandering, we love that one.

SJ: Yes, I do. It's a lovely word.

VW: Yes, it is a lovely word.

SJ: But the benefits of that are not exclusive to flood attenuation.

VW: No, not at all.

SJ: Therefore, shouldn't the funding to create and maintain that come from a variety of sources. Therefore, I think there is some scope around farm management and land management to see, whether or not, natural flood attenuation could form part of that. Not just planting set aside areas for wildlife but actually re-creating meanders and having flood areas, lower areas that are designed to hold water in exceptional flood times.

VW: Yes, Absolutely. That's one of the wonderful things about natural flood management, I think. That it ties in so many benefits and that so many areas will do well out of it, in the end.

SJ: There was a project that Somerset County Council ran when I worked for them, I wasn't directly involved in it. It was called the Parrett Catchment Project. It's a fairly similar thing.

VW: Presumably the river rather than the bird!

SJ: Yes, one would hope! But interestingly, it did all the things that you are already talking about. You already know most of these stuff, but there were two things that were of particular issue, in Somerset. One was planting maize on the Quantocks, on the lower slopes of the Quantocks particularly. In Somerset, for some reason, maize became a crop that was agriculturally attractive because the return on it was better than others and the soil type was good. However, maize compacted the surface soil. So, when you got run off in very intense storm ebents, you didn't only get a bit of soil on the roads, you got the whole field on the road. So, interestingly, our partners in Highways maintenance invented a machine, that was like a snow blower that would go up these lanes and blow the earth back onto the fields, because it was such a problem.

VW: Really, that's amazing, because of the difficulty in getting into our assets. It's interesting because I have done some catchment sensitive farming stuff. But, it's interesting that it's cheaper for the farmers to go back out and have the soil and fertilisers put back on their field rather than deal with losing it in the first place. So it's about trying to put those things in place to make it worth their while doing it.

SJ: Yes, because people are rational. People behave rationally. So, if you want to make something happen, you need to create the financial environment that encourages the behaviour you want not just lecture at them.

VW: Yes, not just finger waving at all the time.

SJ: So, I thought the Parrett Catchment Project was worth mentioning to you, although you already know all about this stuff. But having that idea that people that work with farmers being the conduit in. Because the land ownership pattern in Somerset was such that it was farmers rather than big country estates. I thought that was quite an interesting one. I mean, we could extend the same type of thing to tree planting and all that kind

March 1, 2022

of thing. Get people planting Willows and Alder and things. That happened in Somerset anyway because of the ground water and the nature of Somerset.

VW: I was just going to say that I am working with the Test and Itchen Catchment Partnership at the moment. We've got a project running that's being sponsored by The Heritage Lottery Fund.

SJ: Excellent

VW: It's natural flood management, in this instance I said I would lead for them and we actually did a presentation before Christmas and the guy said "I think we need to extend this, this is a good, strong part of the project" So. I am going to try and tie it into this and do an event and some training and have some workshops as well, just to get people talking about it, with similar ideas to this.

SJ: That sounds really, really good. I think also, to think laterally. People like Fire and Rescue might be good advocates, because they get involved at the hard end of dealing with flooding events. On the surface they have quite a lot of capacity and quite a lot of community outreach.

VW: They do, that's really true. We do work closely with them throughout. We always have the blue lights at the Technical Delivery Group and things, so getting them involved, as you say, to use their networks.

SJ: Yes, that's right. Different groups outreach into the community in different ways, don't they? I think getting HALC involved and getting the Parish Councils signed up to the intellectual side of this would also be a really useful thing and there are other things that could be done through that. You always have to be a bit commercially aware. So organisations that want to self flood defence, kits are a potential sponsor for some of this stuff. So, the companies that make the individual property protection stuff, are they a potential sponsor for projects with this because it gives them a receptive audience.

VW: Yes, judging by the number of people that ring me up on a weekly basis from them, I am sure we could get something out of them, to be honest.

SJ: Exactly, You'll know all this better than I can.

VW: Yes, but it's great to have these ideas come back from a senior officer. Yes, that wasn't a link that I had made with this particular project but they are all there.

SJ: Yes, we are getting near the end of our time. But I think the biggest challenge for you is to find a way of creating a financial model that works. If you can do that everything else will fall into place.

VW: Yes, it is a financial enabler, isn't it?

SJ: It's not being dependent on Government funding is the crucial thing.

VW: Yes, that is so useful, Stuart, thank you very much indeed.

SJ: Well, I hope it has been.

VW: Yes, it has. It's really aligned some of my thoughts, I think. It's nice to hear you say some of the things I was thinking anyway and know that at a different level they are what people are thinking.

SJ: Yes, I am passionately interested in this and I would love to make us successful.

March 1, 2022

Appendix B

Interview with Councillor Rob Humby, Deputy Leader of Hampshire County Council and Executive Member for Economy, Transport and Environment

VW: Good Morning, Rob, thank you for agreeing to speak with me today. I am currently doing my dissertation for Masters' degree in Flood and Coastal Erosion Risk Management at Lancaster university. So essentially, what I am looking at is normalizing Natural Flood Management (NFM), using NFM techniques, off-line storage, slowing the flow, doing a lot more storage upstream and tree planting. All those sorts of techniques, which aren't new but are a bit untested. I am working with a Ph.D. student at Southampton University, who is doing lots of practical stuff. She has some people with her, who are out in the fields, particularly on chalk geology, because of course, with chalk it's a bit more difficult to work out what the surface management techniques are because there is so much infiltration. Thus, there is a lot of technical stuff going on there. What I wanted to look at was more the Social Science and the Political side of things. We know there is a lack of evidence, that's one thing we are working on, but it's the perceptions that people have, that it's all a bit green and fluffy and we would rather just have concrete pipes in the ground because we understand that and know what is going on. I was really interested to hear what people like yourself and Stuart and other key members of the Council think when we say, we are going to have big green field with offline storage and we are going to hold the water up there as opposed to piping it down as we did in Hambledon.

RH: The biggest thing for me is about partnerships and with partnerships working. I read some of the notes that you sent through earlier and one thing I made a point this morning, thinking about this. If you think about natural capital and what the New Forest are doing on that, with their Green Halo work and everything else that they are doing. All the planning goes through Social, Economic and Environmental, those are the three core things of planning, aren't they? No one thing should have more weight than the others. Now natural capital is saying that. Slightly different to what you are doing but there can be benefits to those too. I made a note, I'd written down here, that nature has been doing this on its own for thousands of years. Open your eyes and we need to listen to what nature is doing.

VW: That is pretty much my opening sentence for my dissertation. This is not a new concept.

RH: Yes, nature has worked this out all on its own. This isn't rocket science is it? This is why, when we are looking at planning and people are saying, "Why are you building there?" Some of these things were there for a reason, weren't they? Villages evolved because of the natural landscape and they evolved because there was a stream or a flood area. Farming then, bearing in mind and looking at it like this, we have two National Parks, don't we? Those areas have been intensely farmed for over a thousand years and now everyone thinks they are good enough to be National Parks. That is because if you work with nature and what you have got, it works! I know farmers don't get it right all the time. There are good farmer and bad farmers as in any industry but the ones who work with it, work with because they have to. That is my main point, because it is economically sensible to do it and the only way to do it. You don't go and grow spuds in the middle of a clay field or grow wheat on the side of a hill where you would graze sheep. It's natural, it's what happens. That also happens to the environment, and I can't think of a better fit when you are trying to manage water and floods. It applies to everything, absolutely everything.

VW: Yes, and certainly, from my point of view, NFM has so many other benefits. It's heavily involved in how you farm, catchment sensitive farming, getting people on board, knowing what you are doing and then the ecology and biodiversity side of things would be a massive boon. However, I still think there is a lot of nervousness about putting things on the ground

RH: That's why I wrote down about partnerships. This is about working with nature and natural capital, if that's the word, and nature has been doing that, alongside now, with engineering. So now we have to accept that with a population of about 80 million, nature has been doing a good job of course and we need to look at that,

March 1, 2022

listen to it and watch what it's doing. But now we also have to work in partnership with engineering, to assist it if I can put it like that, if that's the right word. The biggest thing is about the partnership as far as I am concerned, with the community, farming, the local authority and the EA and everybody. What we can't do, I wrote down here, we need to stop blaming people. You can't just moan at the farmers, moan at industry. What you have got to do is to come up with a solution that is of benefit to them as well. That applies to everything we do. So, what you mustn't do is put barriers in the way but work in partnership, so you all achieve the same. If you go and dictate to farmers and communities, it will never work.

VW: I totally agree.

RH: It's got to be a partnership and an understanding for the greater good.

VW: It's an interesting situation that we get into, doing what we do on planning applications and ordinary water course consents and things. People say, of course you start saying those things because you are anti-development. We say, no, we are not anti-development at all. We want to see development in Hampshire, but we want it to be sustainable and we want it to mitigate the flood risk. So, if we do this early enough in the process with you, as you have just said, we can have a solution that is good for all of us. It is possible, it does work but it's about having that working partnership.

RH: Yes, the MPs get that. The point is, it's sustainable, so that means you don't make it any worse or effectively that you could end up leaving it better than it was before you started. That is what we now need to work towards.

VW: Yes, and that counts for everything, there's the 25-year environment plan, the Commission of Enquiry that we are doing here in Hampshire. All those things are saying that we need to look forward.

RH: So, what I would say now, is that we have started to get a clearer direction from Government about that, with waste management, the 25-year plan, all these things starting to come together. What the County is doing in terms of looking at the 2050 vision and the Commission. I think there is more understanding and acceptance, I'm not going to say we should sit by and let it happen because that wouldn't be right, because a lot of people have been working hard over many years, but I think there is more of an acceptance that we must work together otherwise we will all eventually lose out. This applies directly to what you are doing with water management. In terms of, even if you take just the cost, I'm not even talking in terms of just property damage, the cost literally to the Emergency Services is phenomenal. So, just working together.

VW: Yes, so that's interesting because you have just moved on to something that I think is a bit of a barrier, that is, the funding situation. I know that Stuart has been talking about this for several years, that is the way that they work out the funding, you can understand why the EA has done it, it's quite a sensible, simple way of looking at it, but you have just mentioned the cost, and basically, they are saying that the cost is, houses and properties damaged by flooding. It does not take into consideration things like national infrastructure, road network, as you have said, the cost to the Emergency Services going out to deal with it.

RH: Yes, that was one among many others.

VW: Yes, there are so many other costs and the fact that we are very rural and we don't have vast numbers of vulnerable people.

RH: There is also the stress it causes, there is the cost to the National Health Service because of issues like that. The problem I see with this sort of thing is that everything is done in very short time cycles in funding. We have this in this department. purely on Highways. Everything works on a 4 or 5 year cycle. So, when projects are funded like that, everything needs to be looked at over 20, 30 40 years. The problem is how do you

March 1, 2022

attribute those savings and costs. There are enormous subsidies to the NHS, therefore, should some of that funding go toward doing some of the projects and programmes like this as well. But we are all focused individually on our silos, on our budgets, as we have to make our budgets balance at the end of the year. There lies the problem, it wants someone bold enough to say that we need to look at this over a longer period of time.

VW: Yes, and unfortunately, you have got to accept that in some of those situations it could be a long time before you see any benefits, and how you monitor those. How do you say, actually, that this is so much better, because you can't get a real figure saying that these fewer people have been to hospital because of this. It's about accepting that you are not going to be able to present absolutely everything as evidence but that you know it is having an overall positive effect.

RH: Yes, you know that it is, but this is the problem, everything has to be evidence based to get funding. There lies the critical point of the issue. I know, we know about social isolation, rural social isolation. The incidence of heart disease in rural locations is far greater and it is known that a lot of that is due to isolation. Now, how do you go and evidence that in terms of, if you fund this over 20 years that the saving will be X. It doesn't happen at the moment.

VW: Exactly, you can't. It's very true what you say, at the moment, it is evidence based for the technology that actually works and evidence based for the savings that you will make. As you say, that can be beneficial at so many different levels. But you can't put a cash price on the ecology and things like that in the area either.

RH: And so, we go back to natural capital and the value of natural capital, not in financial terms but in the terms of health and wellbeing of communities. We also have, as an authority, these bodies, a social responsibility.

VW: So, how do you think Hampshire County Council and my team and us can make this happen. We are looking at strategy, we are looking at the Local Flood Risk Management Strategy. We are trying to put some guidance and policy statements in there about what we want and what we are going to support. It's difficult because the legislation doesn't give us a lot of support, it's very woolly. It doesn't really say that you can go out and do this, this this and this. What do you reckon we should be saying?

RH: One of my biggest things with the County is about communications and perception, This is going to sound weird, but it is the reality from that point of view. No matter what you are doing, if the perception is that you are not, or even if you are doing things where perception is the barrier, then our job is to change how we handle that coms message. This goes back to partnership working as well. You say, people say you are anti-development, you are not at all. What we are trying to do is make that message clear that actually, this is of benefit to you as well, and once you do that the political picture changes and the perception, no, not the perception, the attitude of politicians start to change. Unfortunately, that is how we work

VW: That's really good. So, the perceptions that people get of what we are doing here just come from the communications, the information, that we are putting out. If they don't see what we are doing, they don't know, do they?

RH: Strangely, why I was a little bit late, I was meeting with Alison [Alison Taylor, Head of ETE Communications] talking about this very thing. We need to bring the outside in and show people what we do in here, as the perception now is that this is all we are doing. I sometimes think that people think, that I come to the office every day to try and make their lives as difficult as possible. Actually, we all come in trying to improve their lives and keep them safe, for as many people as possible across the county.

VW: Yes, you do. You have to be a certain type of person to want to work in a public body like this. You get a lot of flack, We do for the job we do and yet you do think, actually, you think we are doing nothing, but I have an in-

March 1, 2022

box with 1000s of e-mails in it that show for the last two years I have been battling like hell, trying to do something for you.

RH: Yes, but therefore, you have to say, “why do they think that?” Then it is our job to explain to them actually, what we have been doing is trying to help you. Because if they don’t think that, we are back to perception. Then it is our job to use a different way to get that message out. It doesn’t matter how much evidence you have that this is the right thing to do, if we don’t put that message out in the correct way, it will be deemed that you are just there trying to be obstructive as opposed to quite the opposite.

VW: And that is, as you say, all about partnership working and getting all the relevant bodies in a room.

RH: My number one is, you achieve nothing unless you work in partnership.

VW: Interestingly, though, in a lot of the reading I have been doing around the subject, people see that as a barrier. People see partnership working as a barrier because of the way these things are set up, because of the weird split between the EA and us and what we are responsible for. They have tried to split those responsibilities and the hurdles of working with lots of different people, that is seen as quite a big barrier to NFM. You have got so many people involved, you have landowners, you’ve got upstream landowners who might have to do things to their land that won’t necessarily benefit them directly, it will be for downstream residents. Working with the EA, working with funders, working with things like who is going to be responsible if anything goes wrong and it is all those different relationships.

RH: So, I said about finger pointing. It is about blaming, it’s very easy for us to say that’s the EA, it’s nothing to do with us and it’s just as easy for the EA. When I first met some of the EA members, we had a discussion about this. These people have moved up, they were looking after Twyford then, but are in other areas now. I said “Why don’t we sit around a table and see how we can actually join this up because it’s no good, we will no longer be able to keep pointing fingers at one another. That will not be acceptable for the public or politicians. So why don’t we sit around a table now and work out how we can do this together. You cannot say this is nothing to do with me anymore. Someone needs to take ownership and work together.” Those days, I won’t say have gone, but we can’t work in that way.

VW: No, and I have to say, I must put my little dig in here too, we have to do that internally too. Because we do get to the situation where environment and highways which are two enormous areas of what we do are looking at

RH: Partnership doesn’t exclude anybody. If you can’t get your own house in order, how can you expect to work with these other partners outside of the Authority. House in order? OK, an understanding of each other’s issues.

VW: Exactly and being able to come to compromises and things that work for both sides. Maybe, not the ideal for both sides, but we have been having conversations over the last couple of weeks. People seem to think that things like Health and Safety and highways adoption trumps what we do in our team. I’m like, no, just because we have given you permission to do this, if they are saying that it’s not acceptable, that’s fine. We sit in a room and talk about it, we don’t just go, they have said you can’t do that so we have decided not to and just dump it all in.

RH: And that is the compromise between understanding and that comes back to partnership working for the greater good, doesn’t it? Long term partnership, long term planning. That linked to funding.

VW: So, lastly, to finish off with, your background in agriculture and everything, would you personally, as opposed to being a County Councillor, think that landowners across Hampshire would be open to the idea of giving over

March 1, 2022

land for NFM that wouldn't necessarily benefit them or would there have to be some sort of compensation scheme?

RH: Well, there are two sides to that, aren't there? If their farm, smallholding whatever, benefits from that, there clearly wouldn't be a need for that. It might be, that it actually improves their farming and therefore their profitability. I think if there is, they have been given a bad name. I spoke with the CPRE the other day, at the Commission. There was a farmer giving evidence about how much land they had given over to all the wildlife stuff they do and the question was, was it only them. I said no, a lot of farmers do this all the time. I think you will find there are more hedges planted now than were there during the war, when they were told to produce all this. I think it is an interesting question about conversation, especially as we are going into Brexit and potentially leaving Europe and everything, else at the moment. That will be a factor. What we must not do is ignore all those outside influences that all businesses have. It's not necessarily just farming. Whether it's the paper industry and how they use water, it could even be brewing and the amount of water they use. It affects everybody and it's very easy, I do have a background in assisting farmers and around farming, and I see the other side, but I think a wall goes up when people instantly say, well it's their fault, they must change. If that attitude were a bit different, how can we work with you to improve, you might get a different answer.

VW: Exactly that and even in conversations we have had.....

RH: And that attitude about we are not telling you how to farm, you are farmers and you know how to farm. We do this, we know how to do this. How can we come together?

VW: Yes, and it's through the catchment sensitive farming and the National Farmers Union that we work with.

RH: Yes, and with the National Farmers Union and those partners, but sometimes it comes down to, and can I just say, it doesn't matter what your title is, what the name is on your door, you don't achieve anything, unless you can work with people.

VW: Yes, I definitely agree with that. That's really useful.

RH: I am really interested in this.

VW: That's good. I'm glad.

RH: Yes, that statement I made, that this has been happening for thousands of years.

VW: Yes, exactly. The weird thing is, I am working with engineers, hydrological engineers, it's a big part of what we do. It's very important. As you say it's about using the engineering to complement what is already there. But they say, "No, all these fancy, new-fangled ideas" I say "No, it's what people were doing three thousand years ago. They worked with what the water did naturally and they worked around it, rather than us trying to change it"

RH: Yes, for example, in Aldebury, we have a couple of areas at the bottom of the hill and it always floods there and we are trying to do the work but I get moaned at about it all the time. I've said, it is the bottom, it's where it is, there is nowhere for it to go and I have said that there is more chance of me turning that water into wine than me making it flow uphill.

VW: Excellent, that will be good. I am coming to that next meeting. Thank you, it's been really useful, talking today about where those perceptions are coming from.

March 1, 2022

- RH: This could be a really, useful piece of work, to understand where the barriers are and then we can ask the question, "How do we solve those?".
- VW: Practical things are coming out as well. I've got some workshops booked and some presentations. We are going to do some training with the Local Authorities. It's just about normalizing it more and talking about it, saying, let's start there from first principles and not just stapling it on at the end. That's really good. Thank you.
- RH: It's a pleasure. Thank you very much. We'll meet up when we go up anyway. Anything I can pick up in any way, shape or form. Just shout.
- VW: Thank you I appreciate that. See you later.

March 1, 2022

Appendix C

Interview with Steve Clow, Felicity Roe and Roseanne Salt

- VW: Good Morning and Thank you for agreeing to speak to me. There are several things I wanted to discuss with you. I work very closely with a group in the Test and Itchen Catchment Partnership, who manage the head waters of the Test and Itchen rivers. I am also doing my Masters' Dissertation at the moment, which is to do with the barriers to implementing Natural Flood Management across Hampshire. So, essentially, I am working with a team of people who are good at going out in this and doing the practical, on the ground stuff, whereas, I am doing the desk based stuff. So, what I am looking it is "What are the perceptions and barriers toward Natural Flood Management in Hampshire. So, we are talking about landowners giving up their land, and not being aware of what their responsibilities will be or if they will be responsible for anything in the future. We are talking about the engineers who I deal with, who say "We've put it in pipes for a hundred years, that is what we do. We put it in pipes, and we get it away quickly. We don't slow it down". Funding issues, we have got to pay for these things, who maintains them into the future and the perceptions that people have that they think, frankly, that they are a bit green and a bit fluffy and it was not the sort of thing that we should be investing our money in. I was generally just very interested to find out from the HCC point of view, if we were to start discussing these things a lot earlier on in large developments, what we have to do to get HCC, our estates, our land, our landowners and our residents on board, to champion these schemes and what is it we need to be doing to allay people's fears.
- FR: Should I make some introductions as to what we do? Do you know everyone and what we do?
- VW: I have met with Roseanne before and we have spoken about using HCC land. I am aware of what the two of you do and we have just introduced each other. So, I have got a general idea hopefully.
- FR: Yes, a lot of this is about countryside.
- VW: Yes, and I have spoken with Jo Heath separately.
- FR: So, for me, to come from a from a land and building point of view, things that come to mind. I can recall we did some work, some years ago about identifying any of our buildings that have services in them, which may be affected by rising seawaters and flood waters. Climate change. A huge amount of work was done. I seem to remember being involved. So, this is going to be a bit of a ramble.
- VW: No, rambles are fine.
- FR: The second one is to do with where we have land, just imagine we have three types of land. Firstly, operational land and buildings, so schools and libraries. This might be land with playing fields or land with pavements etc. to put it into simple terms. Second, is land that we are in the process of developing. We are the landowner and we are promoting them, mainly for housing. New communities. It's interesting, someone, I think Tony, used to quote that over a 10 to 15 year period, 10% of all new homes built in Hampshire, were built on Hampshire County Council land. So, we have a financial interest, which is to generate receipt or revenue. There is place shaping interest, which is a community interest but there is also a connected interest in relation to making them responsible developments. So, I can remember when we were involved in doing Merton Rise, you'll have heard of Merton Rise, Popley actually, north east of Basingstoke.
- VW: Yes, I have heard of Merton Rise.
- FR: Two and a half thousand homes and two landowners, we were one, I can't remember who the other one was. Seventeen hundred homes and that was early days for SUDS. So, I remember we designed sustainable urban drainage systems as a planning requirement. It was quite helpful, that was in chalk downland. I can't remember it being a major floodwater issue, not as if it was in Buckskin for example, where it would have been different. I think there is a lack of understanding of what happens under the ground in certain parts of Hampshire. So, we know we have got chalk over here, which is fine as long as you don't try and work it in the winter, when it tends to sludge. We've got clay over here, we've got silt and sands and coastal stuff. Then the third bit of land is the land which I would describe as the land we cultivate and we look after. This includes the county farms, which Rosie is responsible for, we own land, particularly around the coast and in areas dotted around Hampshire, which was acquired to restrict and prevent development.

March 1, 2022

So Chilling, Titchfield Haven as an example. We own land south of Winchester, Compton. We own land up by St. Swithins in Winchester, actually to prevent future development or potentially control development. So, if you begin to chunk it down as to how we then might have an approach which, and I am acutely aware of this, that the County Council is responsible for flood water management, as a statutory body. I don't know a huge amount about it and that it is an underestimated major issue which affects us around the County.

VW: Absolutely!

FR: I live in Arlesford and if I drive back around Kings Worthy and Springvale I am aware of the flood water issue affecting roads. So, somewhere there might be: "What is the County Council's total Strategic Approach". But there is a challenge, which is the same challenge that we have in relation to land development. There will be conflicts between us as developer and us as regulator. We are having a lot of those on things like on Manydown and the like. Is that alright? It's a description.

VW: Yes, thank you. That is really, useful background. Really useful to know. I probably didn't have an idea of quite how much land we did own. But, as you say, for strategic purposes as well. But, if we were particularly, to look at this land we are talking about cultivating and looking after. If someone came to you and said "We are going to carry out this development and this is going to happen and we need an area for off-line storage for this amount of water. It will probably only flood once every five or six years, that will be under extreme flows". What would be the perception that as a system. What I am trying to get to, as you have just pointed out, developers have to make sure that surface water flooding doesn't increase when they build a development. Our role comes in here, we manage that. We try to get them to do it on site, sometimes that is not possible for the majority, because of the space and we can work with them to do wider, natural flood management systems that mean we are holding back and attenuating the water further upstream, so that those peaks of volumes of water and rates of water flow can be decelerated.

FR: Which is what the rescue could be, ponds in the banks, on the bridge by the M3
Because my service had to pick up the pieces when the bridge flooded the first time round and the also when it happened the second time round. Although the building wasn't wrecked. So, it depends on which hat you wear. So, I think, it's about early engagement, isn't it?

VW: Yes, that's exactly what it's about.

FR: It's about having a contact in my estate management team which says, these are our critical areas in Hampshire. Do we have a land interest there that could be of assistance or a land interest there that we would want to protect.

SC: So, what are you trying to tell us here, your point of view? what is your question?

VW: The question that I am trying to get to the end of, after a year is "What are the perceptions that people have of natural flood management". Because, to be honest, when we go out and talk about it, a lot of people are like "We think it's a bit grey, we think it's a bit rubbish". No-one invests in it. We totally understand that there is an evidence gap for it's effectiveness. That is for several reasons. You have just alluded to it, that we are on chalk, 60% of Hampshire is on chalk. It's very difficult to prove the effectiveness of natural flood management on chalk because of it's infiltration capacity and we are talking about surface water. I am working with teams of people who are working on the effectiveness side, but it is just, we know that when we go and talk to people, investors, when we talk to people that own land, when we talk to people who own buildings that could invest in these things, there is just not enough championing of the process. It could very well be to do with knowledge. It could very well be to do with the lack of evidence. There is a lot of feeling that it is just a bit of a green, environmental way to do things. I am just trying to get to what those perceptions are. What we think as Hampshire County Council at high level, what the EA think. What other organisations that I work with think, what landowners think. So that we can change those perceptions at ground level, to make more people support us.

FR: If I can stand in. Obviously, I am coming from a coastal point of view, and I think that the perception generally along the coast and perhaps progress in general, is a little bit different than you have experienced, assuming that you are talking primarily in land and surface water flooding. There is a huge amount of work going on along the coast at the moment. The Solent is recognized nationally as being a bit of a trailblazer in this issue. There are a lot of projects going on for the last five years and even something that came into my inbox this week. Trying to condense all the information down, I think, as you alluded to earlier, there was the review of Hampshire County Council's land holdings and the impact of climate change, back in about 2006/7. That set out key area working groups for Hampshire County Council's land holdings

March 1, 2022

around the coast. This is all coastal. These groups looked at different solutions for addressing those risks. It also, and I have some of the documents here and I think they are available through what was Hants File also. They looked at what was the social, the economic, the environmental, the political threats and opportunities and risks etc. associated with all these options and that might give you quite a good baseline. Most of those remain valid. Some of the legislative elements have moved on a bit, particularly with the environmental legislation, quite a bit has changed in that time. Parking that review to one side, although related as the issues are the same across the coast. Do you know of the shoreline management plan and the Eastern Solent Coastal Partnership.

VW: Yes, I do.

FR: All of their work is very current at the moment. They are addressing a strategy from Hamble to Porchester looking at coastal erosion and flooding risk, up to about the year 2100, divided into three epochs of time. The policies included in it for different units included in that coastline, including many of Hampshire's land holdings, is something like hold the line, mandatory alignment, which is where we need to focus today, which is the actual natural options, so breaching heart defence, and allowing farmland perhaps, behind to flood and go back to coastal habitat. Now, the Eastern Solent Coastal Partnership are doing a huge amount of work on that. I went to a workshop in November, where they identified about 17 sites which they want to take forward. Seven of which are priority sites, one which is a Hampshire County Council site and possibly a second one, but I wasn't in the subgroup for that. It's being kept fairly in-house at the moment, within the authorities and working groups involved, of which Hampshire is one, because, of course, of public perception and concerns before the facts are known. But essentially, that is looking at mandatory alignment and increasing different habitats there. Some other work, which is very much of the moment, is the beneficial re-use of dredging, that is using dredging. We have done a lot of work on that ourselves, as well as being on steering groups for other projects. There is a lot going on.

VW: You said about keeping it quiet because of public perceptions. That is the kind of area that we are interested in. I know a lot more about the surface water stuff, although to be honest, I do coastal things as well. But, you are saying that we are worried about the public perceptions, so we are not talking about it publicly. So, what do we think those perceptions are?

FR: OK. So, the perceptions would be things like the loss of footpaths, the social amenities, who is going to pay for it, where is all this money coming from. Those quick to jump on sort of things, obvious points really. Before those authorities have bottomed out how they might address re-routing footpaths, how they might address the car parking. Access to the beach.

RS: Yes, exactly, things like that. Also, did you know that certain species of birds nest there. If you re-route the footpath, you might damage that. Did you know that there is a bit of archaeology buried there that needs protecting, did you know that that is MOD land, did you know there are services there?

VW: They think we don't have maps, don't they?

RS: Yes, I think with the Medmerry scheme, do you know the Medmerry scheme? It was a large breach over on the Sussex border.

FR: Not far from Selsey Bill.

RS: Yes, that's right around there. Really interesting project, it's a shingle beach, the sea broke through it and flooded farmland behind and created habitat which is legally required. Created, that's a separate thing that I will come onto later. It has created a public amenity, which is great. It has created much needed habitat, which is required as compensation for other developments. Other things can't go ahead unless this habitat is created. Also, the farmer is a winner, because instead of just having beef he now has salt-beef and he is "quid's in" on that! So, three big barriers they had to that, one was waste disposal, always an issue, also services crossing under that land. So, the Eastern Coastal Partnership are trying to shy away a little, at the moment, from those sites that have got more services, because they really become unstuck.

FR: Yes, if you have main services behind the seawall it is a massive issue. So, you have part of the seawall which is deteriorating and you've got a main service right behind it. Otherwise, you would just re-profile the beach, move the road back and it's hunky-dory.

March 1, 2022

RS: Yes, as a final point. There is a project going on the beneficial re-use of dredging, being managed by the same forum, delivered by a consultant, with a working group, of which I am a member. That is down at Lymington, it may involve some Hampshire land down there as well. It's primarily the New Forest District Council, where saltmarshes are eroding, which means where you need to hold your line behind, whether it is property or access routes etc. They want to re-use dredgings from marinas around the Solent, which must be disposed of anyway. Deposit them onto that saltmarsh to protect it and to buffer it. That is obviously far cheaper than hard engineering, although it's still very, very expensive. Also they are looking at potentially, this is the thing that came in last week, using the dredgings to reform into geo-blocks, that is a dense type of block made of mud, that is then a natural defence that can then buffer and protect against the sea. That sort of thing might work on riverbanks too. I used to be EA and do a little bit on fresh water.

VW: Yes, I understand.

RS: Then, things like oysters. Oyster shells, depositing them as a natural barrier. This is small scale, but you have to think of small scale to give you confidence for the bigger scale projects. There is an awful lot out there. To answer your main question, I think there is an awful lot of information out there, which we can discuss outside of today and pick up later. But, on those barriers, I think on the coast, those barriers are very well known and understood and a lot of work done to address them.

VW: Yes, much more so than on surface water. For example, at ABP the other week, I said if you are doing projects what do you do about your surface water, She said, "Oh, we just angle everything down to the sea" but, I said, "What if it floods?" So, I think the idea of attenuating stuff on the land is still not clear with people. They are trying to get it to the sea as quickly as possible, whereas we are saying No, we can hold it on the land. If we can attenuate it in places, then it doesn't cause flooding in one place all at once. That is really useful. Thank you. What about from farmer's points of view, from whom you have spoken to in the past, because I know we have had discussions about this before.

SC: Yes, when I got your e-mail through, I did an initial jot down of some of my thoughts for you.

VW: Thank you very much.

SC: So, Initial things were:

- 1 Reduction in the land value, both from an agricultural perspective, if I know that field is going to be an attenuation pond and, in theory, flood once every five years, but in fact it could happen more. Do I bother cropping it or will I just lose the crops. Should I then just fence it off and shove a horse in there instead. Then, around where do I put my horse if it does flood. Then, the reduction in land value from "If I want to sell it on for anything, including future development. How is that affected?"
- 2 Compensation for farmers and landowners for the reduction in value of the land, the reduction in the farmable area, the usability of it, their crop loss etc.
- 3 The cost and responsibility for any on-going management of newly created areas.
- 4

We talk about attenuation e.g. the outer Winchester flood alleviation project. For a little period, there was talk of an alleviation pond on some cash farmland in Kings Worthy there. That was a case of, how big do you want this pond to be and every time we asked it, it changed the size of it. So, does it need to be a pond, could we not just run a ditch along the existing track? Is there not somewhere further upstream where we could maybe plant a woodland to hold it back. Is there not a benefit to when we do plant something like maize, putting it in an opposite direction so that it doesn't run with the slope and it holds the water back that way. There was a safety aspect too. If we have a pond there, right next to a main road. What happen if kids want to go jumping in there and things. Do we have to fence it off and who is responsible for maintaining that fence? Who is taking on that risk?

Also, I would say that there is a landscape impact. Quite a lot of people would say, I quite like looking out of my window and see rolling green fields. I don't want to see fallow land with furrows to stop water running down. I don't want suddenly to have a woodland planted so I now longer get light in there.

When I started looking into it even more, I started thinking well actually, it's yet another pressure on green and agricultural land to deliver benefits other than food and access to the countryside for the public and is that right in the current climate of unknown food security and population growth. In terms, for example of your farmer in Sussex, I'm guessing he is not a tenant farmer, he probably already owns that land, and he doesn't mind taking a backstab and the number of animals I can have may reduce, but I can work to make it more of a niche product. If that were a tenant farmer,

March 1, 2022

he would be going OK, how do we fence, now people are walking here, that's not great. If I have male cattle, that's not safe. Do I have time to try starting to market a new product when I have to make sure that I pay my rent each month. I know that's how our tenants would look at it and if you did approach us, for example, the Kings Worthy one, "Can we have an attenuation pond there?" There is nothing in the terms of the tenancy agreement that gives us the power to force them to accept that, at the moment.

VW: So, do you think that there is somewhere, the opportunity for us, as the organisation we are, to take on some sort of underwriting, or work with the farmers and say that we will provide you with the funding to make this land suitable for this kind of thing.

SC: Yes, if there is a business case for it and no-one is going to be unduly put out by having to do extra maintenance of areas, for no return, then there is definitely something that could be done, but, I will also say, that is about getting the right things in the right places. It's easy to say an attenuation pond, but should it be that, or should we be looking further upstream at woodlands. The Environment Agency is putting an evidence-based paper out, "Working with natural processes", and the best things in there seem to be, rather than attenuation ponds, rather more catchment woodlands, cross-slope woodlands, flood plain woodlands.

VW: Yes, there is a vast number of different techniques around, but it is about mixing and matching and the social engineering, but it's more the concept around it and if HCC would support it and if there is anything we could do as the organization to get other people on board and to champion it. That's really useful.

SC: Yes, especially if it's not just Hampshire County Council flying the flag and holding the torch, I think you would see more of a buy-in across the section buy-in. Then it's "Well it won't be just me being told by Hampshire that I have to plan this particular way" It will go "Well my neighbour up there is being told by Natural England or the Environment Agency" and so saying "Well, we are all in it together" and look at the reflective glory from it as members of the community.

FR: I think my coastal example have been delivered, they have done a really good job at going through that process and not just coming along and saying "OK, this is what we need to do and this is what is going to happen" and engaging. The best example I've seen, I think of any project I have worked on, of how they have done it, promotion, and how they have done their consultation, to deliver what you think might be incredibly tricky.

SC: I'm Just conscious of time, looking forward, in terms of this work generally and whatever work is going on. What are the plans, I am thinking, Manydown. We are a joint agent in it, we are going to be on the Development company. So, what sort of engagement are you looking for?

VW: Certainly, what we are pushing for, as a team and as lead Local Flood Authority which is what we are. As an Authority is for that, as you have said, really, early engagement with the developers. At their total master planning stage. We need to be talking about what parcels of land we are talking about, geology, we need to be looking at geography, we need to be looking at what the levels are doing and talking about where the sensible places are.

FR: Many of things will have been consulted on, you've no idea what's been said.

VW: Yes, you can see the problem we are going through at the moment.

SC: So, where are you, at the moment, with Manydown.?

VW: I don't have that information on Manydown I'm afraid. I've just started to get involved in Welborne. But I am not personally involved with Manydown.

FR: Yes, well we have the land at Welborne, the other is still planning

SC: So, who would have been consulted on Manydown.

VW: That's P (redacted) and L (redacted) who sit on the wider strategic planning group. I'm more than happy to go and speak to them about it and have conversations about it. We are only talking about our own internal processes. Because we have only had these powers for a couple of years and we haven't done a lot of these very wide things. It's about when we comment and what we say, because if we ask for all the information we want right up front, they just aren't going to

March 1, 2022

have it. So, we haven't been involved in the very early master plan stage. We are brought in and they say "comment on this" and we say we don't even know if that is going work.

SC: So, how do you want to be involved? You are sitting here talking to people who are at the top How do you want to be involved?

VW: So, as I say, what we did with Welborne, we got invited along to a pre-planning session, a kind of master planning session where we were talking about what the land was, what parcels of land, what the plans were to do what. Then we could say, "Right, if we know you have got this amount of area, we have vague rates of the surface water run offs are going to be, we can convert that into metres of water and we can work out what storage is needed somewhere on that site". It can infiltrate, it can be put into ponds, it can be put into SUDS systems, but we can do that right at the beginning rather than, unfortunately, what happens is that they get 80% of the way through the process and then they say, "Oh, it doesn't matter, we'll just put it into pipes under the ground" Yes, and we are a very tight, little team, there are only 6 of us and we cover lots and lots of different areas. I am really keen to get us a lot more involved at these early stages, these planning stages.

FR: Yes, because Manydown is past its early stages.

SC: Yes, there was a significant discussion at the last Manydown Topco. meeting, which you were not at, around how they were going to manage surface water. Nothing specific, but there were discussions about tanks and things, and where we would put significant amounts of rain etc. So, none of that planning has happened, so it's absolutely the right moment to get you involved. That's fine.

VW: Yes, that would be more than good. If you come to myself or Simon Cramp, or Laura and Pete in strategic planning, because we work between environment and strategic planning and to get involved in those meetings would be great and to work very closely with the engineers, as well, so we have got them on board. Thank you very much, I appreciate that and it's been a very useful conversation.

SC: Well, you have got the contacts, make the most of them, not just for this piece of work.

VW: Absolutely, that's great, Thank you very much indeed.

March 1, 2022

Appendix D:



YOU'RE INVITED TO OUR ONLINE EVENT:

EXPLORING NATURAL FLOOD MANAGEMENT
TUESDAY 2ND MARCH, 4 - 5.30PM

FLOODING IS A PRESSING ISSUE FOR MANY COMMUNITIES ACROSS HAMPSHIRE, INCLUDING THOSE NEAR THE CHALK STREAMS THAT FEED THE RIVERS TEST AND ITCHEN. WE'D BE DELIGHTED IF YOU JOINED US AS WE EXPLORE NATURE-BASED SOLUTIONS TO THIS PROBLEM.

THIS FREE ONLINE EVENT BRINGS TOGETHER SEVERAL EXPERTS IN THE FIELD TO SHARE HOW NATURAL FLOOD MANAGEMENT (NFM) COULD BE USED IN OUR COUNTY. WE'LL BE DISCUSSING:

- HOW IMPROVEMENTS TO UPSTREAM AREAS CAN REDUCE FLOOD RISK AND IMPROVE WATER QUALITY FOR COMMUNITIES AND HABITATS DOWNSTREAM.**
- HOW NFM TECHNIQUES LIKE TREE PLANTING, GROUND ROUGHENING, AND RE-MEANDERING OF RIVERS CAN HELP TO MANAGE HIGH FLOWS.**
- HOW DESIGNATED RISK MANAGEMENT AUTHORITIES LIKE THE ENVIRONMENT AGENCY AND LOCAL COUNCILS CAN SUPPORT THE USE OF NFM IN HAMPSHIRE.**
- WHAT BARRIERS ARE IN PLACE WHICH ARE PREVENTING NFM SCHEMES FROM TAKING PLACE**

THE EVENT WILL BE HELD OVER ZOOM, SO PLACES ARE LIMITED - YOU CAN BOOK YOUR FREE TICKET THROUGH THE EVENTBRITE LINK BELOW. PLEASE CONTACT WINTERBOURNES@HWWT.ORG.UK WITH ANY QUERIES

Appendix E:

WATERCRESS AND WINTERBOURNES NATURAL FLOOD MANAGEMENT INFORMATION EVENT
[ZOOM MEETING \[LINK\]](#)
TUESDAY 2ND MARCH 2021, 4-5.30PM

• 4PM	WELCOME & INTRODUCTION	MORAG STIRLING, WATERCRESS & WINTERBOURNES
• 4.10PM	AN INTRODUCTION TO NFM AND HCC'S INVOLVEMENT	VICKI WESTALL, HAMPSHIRE COUNTY COUNCIL
•	INTRODUCTION TO HCC'S RESPONSIBILITIES AS LEAD LOCAL FLOOD AUTHORITY FOR HAMPSHIRE/STATUTORY ROLE. DISCUSSING OUR WIDER REMIT INCLUDING PARTNERSHIP WORKING AND NFM. OUR INVOLVEMENT WITH THE CATCHMENT PARTNERSHIP, W&W AND ONGOING PROJECTS IN THE W&W AREA. A DISCUSSION RE PERCEIVED BARRIERS TO IMPLEMENTING NFM SCHEMES IN HAMPSHIRE	
• 4.25PM	WHY SHOULD WE MANAGE WATER BY CATCHMENT?	LUKE NEIL, CATCHMENT BASED APPROACH
•	THE CATCHMENT BASED APPROACH (CABA) ORGANISATION WORKS IN LIAISON WITH LLFAS AND THE EA TO PROMOTE THE MULTIPLE BENEFITS OF MANAGING WATER ON A CATCHMENT SCALE. THIS INCLUDES HOW WORKING WITHIN DIFFERENT AREAS, PARTICULARLY UPSTREAM AREAS, CAN EFFECT ENTIRE RIVER BASIN CATCHMENTS AND SIGNIFICANTLY REDUCE FLOOD RISK AND IMPROVE WATER QUALITY TO COMMUNITIES AND HABITATS FURTHER DOWNSTREAM.	
• 4.40PM	EFFICACY OF NFM IN GROUNDWATER CATCHMENT AREAS	IMOGEN BARNESLEY, NATURAL ENGLAND
•	IMOGEN HAS COMPLETED A 3 YEAR PHD PROGRAMME ON THE EFFECTS OF WELL KNOWN NFM TECHNIQUES INCLUDING TREE PLANTING AND OFFLINE STORAGE, ON CHALK BASED GROUNDWATER CATCHMENTS. IT IS BECOMING MORE WELL KNOWN THE EFFECTS OF GROUND ROUGHENING, TREE PLANTING AND RE-MEANDERING CAN SLOW THE FLOW ON CLAY/IMPERMEABLE SURFACES. HOWEVER, THE EFFECTS ON PERMEABLE SURFACES ARE LESS WELL UNDERSTOOD, AND IMOGEN HAS MADE A SIGNIFICANT IN-ROAD INTO UNDERSTANDING THESE EFFECTS.	
• 4.55PM	HOW THE EA AND LLFAS CAN SUPPORT NFM SCHEMES	PETER EDEN, ENVIRONMENT AGENCY
•	WE UNDERSTAND THAT THE SHEER NUMBER OF ORGANISATIONS AND RISK MANAGEMENT AUTHORITIES INVOLVED IN WATER MANAGEMENT AND FLOOD RISK REDUCTION CAN BE CONFUSING. THIS, ALONG WITH UNCERTAINTIES REGARDING RESPONSIBILITY, INSURANCE, LONG TERM MAINTENANCE, FUNDING ETC, MAY MAKE THE DECISION TO BE INVOLVED WITH NFM A DIFFICULT ONE, EVEN IF YOU SUPPORT THE PRACTICE IN PRINCIPLE. THE EA WILL BE EXPLAINING HOW THE RMAS CAN SUPPORT AND ENCOURAGE NFM IN THE W&W AREA AND WIDER ACROSS HAMPSHIRE.	
• 5.10PM	PANEL Q&A SESSION	ALL
• 5.25PM	WRAP UP AND THANK YOU	MORAG STIRLING
• 5.30PM	MEETING CLOSE	ALL

March 1, 2022

Appendix F: Summary of NFM questionnaire responses

Q1 - What NFM methods have you heard of?		78 responses				
	Creating or enhancing wetlands	76	97%			
	Creating Ponds/Lakes that are online (connected to rivers/streams)	65	83%			
	Creating Ponds/Lakes that are offline(disconnected from rivers/streams but used for water storage)	47	60%			
	Installing permeable or leaky wooden dams	45	58%			
	Installing soil barriers/banks (bunds)	50	64%			
	Returning redirected rivers/streams to their natural course	62	79%			
	Returning straightened rivers/streams to their natural meander	67	86%			
	Daylighting	27	35%			
Other						
	Beavers	16				
	Soil improvements	2				
	Methods to slow field run off	6				
	Flood plain re-connection	2				
	Tree planting	5				
	Urban SuDS	1				
Q2 - If you know of any places in Hampshire where NFM measures have been implemented, what can you tell us about them?						
	Winnall Moors	4				
	Within the New Forest National Park several projects have restored streams to their original meanders, reinstated wet, boggy area and removed artificial banks and drainage systems.	7				
	Titchbourne Stream	1				
	Bourne Rivulet	2				
	Test and Itchen	7				
	Fishlake Meadows	2				
	River Lavant (Havant)	1				
	Nore Farm	1				
	Potwell Farm (potential)	1				
	Ovington Mill	1				
Q3 How would you rate your understanding of how NFM works?		Very Good	Good	Average	Limited	Very Limited
		11	20	30	17	1
		14%	26%	38%	22%	1%
Q4 How would you rate the available information and evidence about NFM?		Very Good	Good	Average	Limited	Very Limited
		5	13	27	19	3
		6%	17%	35%	24%	4%
Q5 Which of the following do you most associate with NFM?		78 responses				
	National authorities (e.g. Environment Agency, Natural England, the Government)	24	31%			
	Environmental/conservation groups and organisations	46	59%			
	Local authorities (e.g. county councils, district/borough/city councils)	3	4%			
	Local communities	1	1%			
	Landowners	3	4%			
	Other	1	1%			
Other Free text						
	Academic Community	1				
	All Risk Management Authorities (RMAs)	2				
Q6a How would you describe your opinion of NFM?		Very Positive	Positive	Neutral	Negative	Very Negative
		53	15	6	3	x
		68%	19%	8%	4%	
Q7a Do you think NFM is an effective method for managing flood risk?		Yes	No	Not Sure		
		63	1	15		
		81%	1%	19%		
Q8a Do you think flood defences that use hard engineering (e.g. pipes, concrete barriers) are a better option than NFM		Yes	No	Not Sure		
		7	60	12		
		9%	77%	15%		

March 1, 2022

Q9	How would you feel about NFM measures being implemented where you live?	Strongly Agree	Approve	Neutral	Negative	Not Sure
		52	16	7	x	4
		67%	20%	9%		5%
Q10a	Which of the following would be a factor in your feelings? (choose one or more)					
	Evidence of effectiveness of NFM measures	55	70%			
	Reduction in flood risk	66	85%			
	Whether the land could be used for another purpose or not	12	15%			
	Increase in biodiversity and wildlife habitat from NFM measures	73	93%			
	Ongoing maintenance required for NFM measures	31	38%			
	Cost of implementing and maintaining NFM measures	16	20%			
	Protection of heritage features	29	37%			
	Other	7	9%			
Q11a	Who do you think should make decisions about implementing NFM where you live?					
	Environment Agency			25		34%
	Lead Local Flood Authority (HCC)			7		9%
	District, borough, or city councils			4		5%
	Local communities			14		18%
	Natural England			17		21%
	Landowners			2		2%
	Other			9		12%
Q12	Does any of your land fall within the Watercress and Winterbournes scheme area?	Yes	No			
		5	73			
		5%	95%			
Q13	Would you consider allowing NFM measures to be implemented on your land?	Yes	No	Not Sure	27 responses	
		19	x	8		
		70%		30%		
Q14	Which of the following would be a factor in your decision? (choose one or more)				27 responses	
	Increase in biodiversity and wildlife habitat on your land			24		88%
	Reduction in flood risk on your land			11		40%
	Reduction in flood risk further downstream			12		44%
	Availability of funding for implementing NFM measures			13		48%
	Availability of insurance cover for NFM measures			4		15%
	Availability of information and guidance on implementing NFM measures			6		22%
	Evidence of effectiveness of NFM measures			13		48%
	Health and safety responsibilities relating to NFM measures			5		19%
	Increase in biodiversity and wildlife habitat in wider landscape			15		56%
	Legal requirements to explore NFM measures			2		7.00%
	Maintenance responsibilities relating to NFM measures			10		37%
	Potential to affect an Environmental Stewardship Agreement or other commitment			5		19%
	Protection of heritage features on your land			5		19%
	Protection of heritage features in the wider landscape			7		26%
	Whether the land could be used for another purpose or not			5		19.00%
	Other (see below)			8		30%

March 1, 2022

Community Views on Natural Flood Management

As our beautiful chalk streams wind through the landscape, detours can be a natural part of their journeys. The places where they overflow become temporary wetlands that support wildlife and leave the soil rich in nutrients. Over time, however, these floodplains have become dotted with human settlements where the waters are less welcome. With a growing population and a shifting climate, could the joy of streamside living one day be a thing of the past?

If you explore ways to address this problem, you're likely to come across the term 'Natural Flood Management'. Also called 'NFM' or 'Working with Natural Processes', this approach aims to reduce flood risk through nature-based measures like planting trees, creating storage ponds, and improving absorption on farmland. Such solutions have the potential to offer further environmental benefits, from improving biodiversity and water quality to reducing bank erosion.

As such, while NFM measures are already making a difference in Hampshire, organisations like the Wildlife Trust are exploring if their use could be expanded. Earlier this year we helped fellow Watercress and Winterbournes partner Hampshire County Council to do just that, using an online questionnaire to learn how local residents feel about NFM being used in their area. We're now pleased to share some highlights from the results!

Key findings

Most of the 78 respondents had heard of NFM measures like creating wetlands, installing leaky dams, and returning streams to their natural meander. **87% describe their opinion of NFM as 'positive' or 'very positive'**, while **81% view it as an effective approach for managing flood risk**. More than three quarters see it as a better option than hard engineering like pipes or concrete barriers.

However, **over half of the respondents rate their understanding of how NFM works as average or below**. Many voiced a desire for more information about the different measures, and evidence of their effectiveness. Moreover, some suggested that both NFM and hard engineering may be needed in certain areas, particularly if urban development on floodplains continues.

While **90% of the respondents associate NFM with environmental organisations and national authorities**, many feel that decision-making should include local councils, landowners, and communities. **87% approved of NFM being used in their area, citing the potential for increased biodiversity, protected heritage, and decreased flood risk**. This would be contingent on funding and evidence of effectiveness.

March 1, 2022

Several local landowners also shared their thoughts: in total, **70% would consider allowing NFM on their land**, while the remaining 30% feel unsure. The chance to increase biodiversity and reduce flooding, both on their own sites and elsewhere, are common motivations. Evidence of effectiveness, availability of funding, and maintenance requirements would affect their views.

So, what's next?

The information gathered in this questionnaire will serve several important purposes. It will be a key source for an MSc in Flood and Coastal Erosion Risk Management being undertaken by Vicki Westall, Strategic Flood and Water Management Co-ordinator for Hampshire County Council. Vicki will use this research to inform her ongoing work to tackle flooding in our region.

The insights will also be hugely helpful to the wider Watercress and Winterbournes scheme, particularly in relation to our Natural Flood Management project. We'll be putting together resources on flooding around our chalk streams, and the measures that could tackle it, so local residents can make informed decisions about the role NFM could play in their areas.

Of course, as with all questionnaires, **some sampling bias may be at play**: those with an interest in environmental issues are more likely to respond. Nonetheless, we're hugely grateful to everyone who shared their thoughts with us; better understanding the views of our communities helps us to support them. Stay tuned for news on this topic going forward!

March 1, 2022