West Yorkshire Flood Innovation Programme Accelerator Project

Work Package WP2: Natural Flood Management and Green Social Prescribing Feasibility Study Report

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Contents

Executive summary

Many activities contributing to Natural Flood Management (NFM) and Sustainable Drainage Systems (SuDS) are carried out by volunteers, who achieve health and wellbeing benefits while contributing to positive environmental outcomes. Further integrating NFM volunteering opportunities with Green Social Prescribing (GSP) has the potential to enhance outcomes for flood management and health. However, there are also potential barriers, costs and risks for nature-based and health-based organisations, volunteers and service users. This feasibility study aimed to explore the opportunities and barriers for combining Green Social Prescribing with Natural Flood Management and Sustainable Drainage Systems activities within the area covered by the West Yorkshire Combined Authority.

We carried out semi-structured interviews with 13 people from 12 organisations who are involved in either delivering NFM/SuDS, who provide conservation volunteering opportunities and/or who are involved in coordinating or delivering social prescribing in West Yorkshire. We carried out content analysis on the transcripts. We also held informal discussions with organisations carrying out NFM and GSP outside of West Yorkshire and with potential funders. We then ran a workshop with 12 people from 10 organisations (of whom four had been interviewees) where we discussed themes that emerged from the interviews and identified next steps.

Interviewees and workshop attendees identified a range of benefits for both organisations and volunteers/participants from a closer alignment of volunteering activities that contribute to NFM with Green Social Prescribing pathways. Programmes contributing to NFM are already delivering health and wellbeing benefits for volunteers and wider communities, but vary in the extent to which health and community engagement are recognised as explicit aims.

Those nature-based organisations providing NFM and conservation volunteering who had tried to integrate their work with NHS based social prescribing pathways found it very difficult to make the appropriate contacts, find information and receive appropriate referrals. High staff turnover in NHS based link worker roles was identified as a particular difficulty.

The main barrier identified by all interviewees was the lack of funding on sustainable timescales. Models are needed that allow collaborative programmes supporting both NFM delivery and the delivery of health outcomes for wider communities and/or service users who are referred from or supported through social prescribing. Funding for staff time rather than relying on volunteer roles alone for developing these joint initiatives is particularly important in communities experiencing health inequalities.

Some NFM activities and locations are not suitable for some participants with health and social care needs and locations are often distant from communities who have higher need for Nature Based Activities and Interventions. Interviewees and workshop attendees varied in the extent to which they thought further skills training for providers was needed. Most nature-based organisations were confident that with appropriate funding and effective communication with health-based partners, they would be able to adapt existing or design new programmes to meet the needs of a wider range of participants.

Interviewees and workshop attendees tended to have assumptions about what linking NFM with GSP would involve, depending on their background experience. However, there are a range of potential activities related to NFM and SuDS and various ways in which potential participants access these groups and projects. Combinations of these elements result in different models for adapting existing programmes and groups, or creating new pilot activities and collaborations.

Background and rationale

Many Natural Flood Management (NFM) activities and some Sustainable Drainage Systems (SuDS) activities are provided by conservation volunteers working with Voluntary, Community and Social Enterprise (VCSE) organisations (see definitions below). Volunteers may receive health and wellbeing benefits through opportunities to contribute and engage with nature (Patrick et al. 2022; Gerolemou et al. 2022; although see Husk et al. 2016;), although this may not be stated as an aim or motivation. Nature-Based Interventions (NBIs) are organised programmes or strategies that engage people in activities in nature to promote their health and wellbeing (Shanahan et al. 2019; Coventry et al. 2021). These are also often provided by VCSE organisations, with participants being referred or supported to attend through Green Social Prescribing (de Bell et al. 2024; Green Social Prescribing Programme 2023).

There are opportunities for some NFM activities to be integrated with new or existing NBI programmes, with referral pathways for participants through Green Social Prescribing (GSP). NBIs that involve NFM activities might provide participants with enhanced health and wellbeing benefits through opportunities to contribute to nature and their local communities (Figure 1). These activities may also appeal to people from communities and demographics who are currently underrepresented within NBIs and GSP. Nature-based and community organisations could further their aims through greater community engagement with NFM (Morris and Tippett 2024; Tankard 2021), increasing the number and diversity of their volunteers and potentially opening up new funding sources and collaborations.

However, our work in the Humber and North Yorkshire area has highlighted the wide range of referral pathways into NBI and GSP schemes, and the various barriers that can exist between health professionals, NHS-linked social enterprises, community connectors/social prescribing link workers, patients and other users and providers of NBIs and GSP activities (Darcy et al. 2023; Harrison et al. 2024a, b). These include practical issues of capacity, affordability and transport, and also difficulties in communication and understanding between the health and social care sector and VCSE nature-based organisations. There may also be further barriers and needs for both participants and providers that are particularly associated with formalising or developing NFM related volunteering into NBIs. If not addressed these barriers might reduce the take up of GSP initiatives and worsen health inequalities (Garside et al. 2020), while also potentially having negative impacts on NFM delivery and VCSE providers of NFM and NBIs.

Aim

The aim of this Work Package was to build on iCASP and other existing research on the benefits and implementation of green social prescribing schemes to explore the opportunities for GSP to be combined with NFM and SuDS activities within the area covered by the West Yorkshire Combined Authority.

Definitions

This work explores the varying definitions and perspectives held by people and organisations from different sectors, however broadly we use the following definitions:

Nature Based Solutions (NbS) – actions that work with or are inspired by natural processes by protecting, managing or restoring ecosystems to address societal challenges, resulting in environmental, social and economic benefits.

Natural Flood Management (NFM) – practices that restore or mimic natural functions in order to reduce flood risk.

Sustainable Drainage Systems (SuDS) – water management practices that mimic natural drainage processes to result in multiple benefits.

Nature-Based Interventions (NBIs) – programmes or strategies that engage people in activities in nature in order to promote their health and wellbeing.

Green Social Prescribing (GSP) – supporting people or linking people with services to take part in nature-based interventions to improve their health and wellbeing. This referral, signposting or support can be carried out by people working and volunteering in various roles in the health and social care or voluntary and community sector (Green Social Prescribing Programme 2023).

Theory of change

Our theory of change shows how feasibility study activities and wider integration between NFM delivery and nature-based activities for health are expected to result in outcomes and impacts for people and nature recovery (Figure 1).

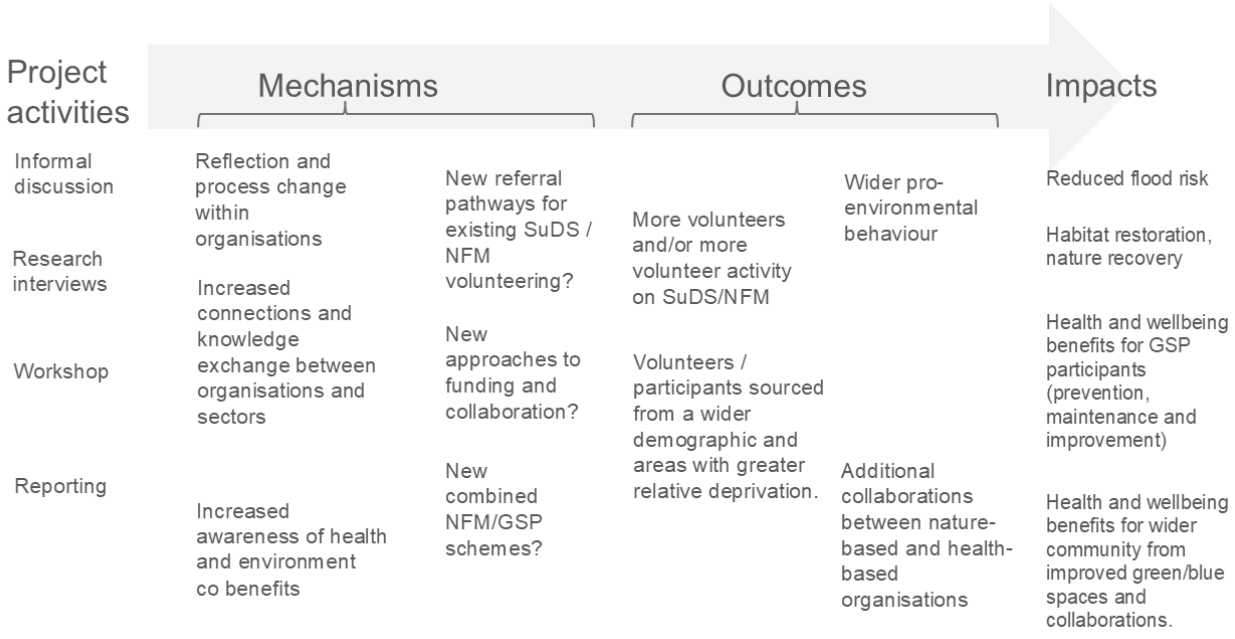

Figure 1. Theory of change for links between Natural Flood Management/Sustainable Drainage Systems and Nature Based Interventions and Green Social Prescribing.

Research methodology

Geographic scope

We used informal discussions with stakeholders and literature to identify three broad areas in which to focus this work: mid Airedale (Keighley to Castleford), Calderdale and Kirklees (Table 1). These areas were selected because:

- There is a need for NFM/SuDS delivery as part of a catchment based approach;
- Activities are located where transport might be possible from wards with a high index of multiple deprivation or might serve communities experiencing health inequalities;
- There is a strong third sector of nature-based organisations with experience in providing broader volunteering and nature engagement opportunities;
- There is a history of community based social prescribing, but pathways for green social prescribing are at a relatively early stage compared with other regions, with horticulture and green exercise dominating the activity types.

Table 1: Project areas

Project area	**Rivers**	**West Yorkshire Integrated Care Board local areas**	**Urban areas**
Mid Airedale (West Yorkshire - Keighley to Castleford)	Aire Worth	Bradford District and Craven. Leeds.	Keighley, Bradford, Leeds.
Calderdale	Calder & Colne	Calderdale	Halifax
Kirklees	Colne & Holme	Kirklees	Huddersfield

We also discussed approaches to linking Natural Flood Management with Nature-Based Interventions or Green Social Prescribing taken by three organisations outside of West Yorkshire.

Interviews

This project received ethical approval from the University of York Department of Environment and Geography Ethical review committee on the 21st June 2024. NHS employees were not invited for interview, as this requires a separate ethical review beyond the scope of a time limited feasibility study.

A total of 13 participants from 12 organisations involved in delivering NFM and/or SuDS, providing conservation volunteering opportunities and/or with a social prescribing role accepted an invitation for an interview. We selected 32 invitees over time to ensure there would be a minimum of three organisations in each of the geographical areas, with representation from at least one organisation with experience of delivering NFM or SuDs and at least one organisation that had a community based social prescribing role. Potential participants were sent a participant information sheet and privacy notice and those who accepted signed a consent form.

Two of the organisations interviewed worked across West Yorkshire, four operated mainly in Airedale, three in Calderdale and three in Kirklees (Table 2). Of those organisations, three were community based social prescribing organisations with a specific linking role (one each in Airedale, Calderdale and Kirklees) (Table 2). One organisation provided green social prescribing activities without delivering NFM. Two organisations were involved with delivering NFM, but not themselves through conservation volunteering.

Six delivered various aspects of NFM through conservation volunteering and also had nature engagement and wellbeing aims.

Twelve semi-structured interviews using a topic guide were carried out by LH using zoom. Interviews were recorded, with automated and additional transcription carried out by LH to produce an anonymised transcript, which was shared with each interviewee.

Analysis of the transcripts used a framework method (Ritchie and Spencer 1994; Ritchie et al. 2013). This began with a stage of familiarisation with the content of all the interviews (Ritchie and Spencer 1994), followed by an inductive approach to generate codes grouped into categories (Gale et al. 2013). Some of these categories and codes corresponded with items in the interview topic guide, but care was taken to allow the data to dictate the structure and codes recurred in different areas of the interview topic guide (Srivastava and Thomson 2009). These categories and codes were then further refined and the finalised framework applied to all transcripts (Gale et al. 2013). NVivo was used to organise the codes and transcripts.

Table 2. Interviewee organisations. For larger organisations this applies to the interviewee's particular subsection. As discussed in findings, conservation volunteering, nature engagement and nature-based interventions activities describe a broad spectrum of activities, with the particular terms used depending on organisational aims and framing. This table is intended to indicate organisations providing activities such as river walks that are separate to a focus on delivering practical NFM or broader conservation volunteering tasks.

Mainly operating in:	Organisation (no) and interviewee (letter)	Sector (Private, public, third)	Delivers NFM or SuDs?	Provides conservation volunteering?	Provides nature engagement activities or nature-based interventions other than conservation volunteering?	Has a Community Green Social Prescribing linking role?
W Yorkshire	2 B	Private	Yes	No	No	No
W Yorkshire	5 F	Third	Yes	Yes	Yes	No
Airedale	1 A	Third	No	No	Yes	Yes
Airedale	3 C & D	Third	Yes	Yes	Yes	No
Airedale	7 H	Third	Yes	Yes	Yes	No
Airedale	11 L	Third	Yes	Yes	Yes	No
Calderdale	4 E	Third	Yes	Yes	No	No
Calderdale	6 G	Third and public	No	No	Yes	Yes
Calderdale	8 I	Third	Yes	Yes	Yes	No
Kirklees	9 J	Third	Yes	No	Yes	No
Kirklees	10 K	Public	Yes	No	Yes	No
Kirklees	12 M	Third	No	No	Yes	Yes

Workshop

12 participants (of whom four had been interviewees) from 10 organisations involved in Natural Flood Management and/or Green Social Prescribing attended an afternoon workshop at the University of Leeds on 2nd December 2024. The workshop was also attended by University of Leeds and University of York staff involved in the West Yorkshire Flood Innovation Programme Accelerator work packages. The workshop included structured networking opportunities and discussion groups led by facilitators using topic cards based on barriers and themes that had emerged from the interviews. In the second half, participants were rearranged into geographical area-based discussion groups to discuss opportunities and potential collaborations.

Findings

Opportunities and benefits

All participants were positive or very positive about the broad concept of combining, linking or seeing NFM within the context of Nature-Based Interventions or GSP for health and wellbeing. There is some self selection in that organisations engaging with this project are more likely to be positive. However, we tried to keep invitations and participant information neutral and actively explore opposing views and barriers during the interviews and workshops. This project has particularly highlighted the extent to which nature-based organisations are already delivering health and wellbeing benefits through programmes that contribute to NFM. Health-based organisations interviewed were universally positive about the opportunities involved, although they emphasised location barriers and the importance of collaborative work and understanding the needs of the communities and demographics being targeted.

"People like to give back. People like to feel like they're useful and that they're helping their community." - Participant M

"...in order to achieve our goals in conservation, we also need that buy in from the community and from people. Otherwise it's just not going to work." - Interviewee F

"I think it will unlock potential for other mental health and wellbeing activities outside of what we currently have within our society, but it also may unlock funding for NFM and nature-based solutions that we currently don't have funding for, because it almost changes the focus of flood management away from defining flood risk, to a more social prescribed benefit for our communities. Which may allow some projects that wouldn't previously get funding, to get it through other mechanisms, maybe through NHS funding, maybe through central government or local government funding." - Interviewee B

"A larger volunteer pool would be fantastic. We rely on volunteers a lot and just having that community engagement aspect as well. And how we would be perceived in the community as well." - Interviewee F

"I mean, one area we're looking at developing is our understanding and offer to people from Gypsy and Romany traveller backgrounds, who, I guess, would be very much affected by flood situations." - Interviewee M

"I kind of looked at what were the type of people volunteering at NFM events? And a lot of them were men and social prescribing and people accessing mental health care, for men it's quite difficult. And there's obviously quite a massive problem with men's mental health." - Interviewee B

Barriers and costs to linking NFM, SuDS and GSP

Nature-based organisations who had already been involved with trying to set up more formal GSP pathways and programmes expressed caution about the practicalities involved, although they generally

remained enthusiastic about contributing to health. They referred to frustrating experiences of seeking information about GSP, absent or inappropriate funding and often a total absence of referrals where programmes had been set up. Some of these barriers and frustration were also expressed by health-based organisations at the workshop. There was no evidence of active supported referral pathways for participants with health needs into activities being run by interviewee organisations, with most participants simply joining themselves (self-referral) or some occasional 'signposting' from other organisations as is usual for conservation volunteering activities. Although organisational capacity building has been raised as a barrier, third sector organisations were positive about their organisational processes and collaborative links they had in place. Appropriate referrals and support, staff training, safeguarding and health and safety issues were all considered relatively straightforward to address. However, the major issue raised by nature conservation organisations was the quantity, targeting and timeframe of funding, which would need to be designed to address the challenge of the separation between the more urban locations with greatest GSP need and the more rural locations of many NFM activities.

Activity types and support needs

The types of activity contributing to NFM delivery need to be selected and adapted so that they are appropriate for the volunteers and people with health and social care needs involved. Experience in group facilitation and risk assessment, and the length of time spent on NFM delivery compared to other activities is also important.

"A lot of NFM delivery is and can be very hard labour. Which doesn't always suit those that really require the social prescribing elements." - Interviewee B

"We try and have a very positive risk-taking approach or mindset when we're deciding what we do and don't do. I guess for years and years lots of groups just didn't have any opportunities to do things because it was just a straight no. Because the perception would have been that well, no, they can't do that. But we try and bust through that as much as we can, without obviously going too far the other way." Interviewee L.

Location

Location also had an influence on the relevance of the different activities, and areas identified for activities due to their proximity to communities were not necessarily those activity areas. Separation of activity areas and areas at risk of flooding:

Referring to how you advertise NFM volunteering opportunities: *"I think the NFM focus would work much better like it is doing in Calderdale. The impacts [of NFM activities] always seems to be felt further downstream, so I think in Kirklees a focus on maybe the biodiversity side, getting out, being active is probably more likely to get more of an impact within those areas from my perspective." - Interviewee K.*

Although the separation of population centres and areas best suited for NFM activities can be a barrier, it can be overcome by funding for shared transport:

"So, if I was to redesign our programme as a social prescribing volunteering programme, I'd buy us a minibus and I'd have one site where we met, even [if] it was just outside our office, and then we went for the day. So, people learned one bus route to one access point to get taken in a familiar environment to wherever we wanted to go, which was beautiful and green, and 'NFM-y'." - Interviewee C.

Funding

Some interviewees drew attention to the limitations of GSP focused funding:

"...if you want to do social prescribing and you want to deliver large-scale rural NFM, that combination together isn't necessarily cheap. […] Once you tot up two staff members, prepping and delivering for 45

days of the year, there's crumbs left over for the equipment, or whatever the activities you want to do. Clearly when they write, when they say, social prescribing, in their head I think they've got someone delivering pottery in a church hall." - Interviewee C

"We applied to NHS [funding]...and essentially, we were told, well, that's not a deprived demographic, or it's not a deprived enough demographic. We picked a bit of [town] [that] was relatively deprived, in the bottom 4th decile, but it wasn't in the bottom one or two." - Interviewee C.

There were also some limitations of NFM focused funding that were identified:

"If it's between getting a project delivered and allowing kind of that social prescribing element to come in, it could be quite difficult to justify it to funders. Not necessarily saying that that's something that couldn't be worked around. [ ] But I would say smaller charities and smaller organisations may struggle with those elements, whereas maybe larger charities wouldn't have as many barriers to that." - Interviewee B.

Communication across sectors

Nature-based organisations with little or no experience in GSP tended to identify GSP as sitting entirely within the NHS and found it difficult to identify who to talk with to set up referral pathways and collaborative programmes. There was some frustration expressed over the amount of publicity about the general effectiveness of GSP and nature-based activities for health interventions for health, while there was no specific information aimed at nature-based groups about how to go about setting up pathways and seeking funding.

"I did look into it, I think about, a little over a year ago, when I first started working for [organisation 4]. But I found, the information that I was able to find just wasn't helpful at all. It didn't… couldn't find any guidance on how to become involved and be, you know, become accepted as a provider." -Interviewee E.

Volunteering organisations where people had been referred to them had almost entirely been signposted or supported from other third sector organisations, with very limited direct connection with the NHS. There was a perception that NHS organisations were more likely to set up and run activities 'in house', rather than effectively engaging with third sector nature-based activities and recognising the importance of non-medical settings for many participants. As this project did not interview NHS employees it is difficult to assess motivations. However, community health-based organisations highlighted that they needed to have confidence that their clients could be safely supported and that the timings and locations of some activities could make them difficult to access.

Models for linking NFM, SuDS and GSP

The interviews and workshops suggested that most people had a particular model when considering how Natural Flood Management would be linked to Green Social Prescribing. Most of those from a conservation volunteering background talked about how volunteers with health needs might be integrated into existing groups. Many with a volunteering background saw conservation-based GSP activities as a means of delivery of NFM, while simultaneously resulting in greater nature engagement and health and wellbeing outcomes for individuals. However, there was a split within people with experience in flood management. Some of these, who were not based in volunteering organisations, assumed that most activities connected with delivering NFM would be inappropriate for people with health and social care needs. They tended to view Green Social Prescribing through the lens of Natural Flood Management community engagement activities, perhaps with a focus on wellbeing activities for communities affected by flooding. Those with a health and GSP background placed NFM within a much broader set of conservation volunteering activities and wider nature-based activities, such as river walks. Their focus was understandably on the health and

wellbeing benefits for participants, while also having positive impacts on the quality of local green and blue spaces.

Activities potentially carried out by participants in GSP programmes can be considered on a spectrum of their relative contribution to NFM and SuDS (Figure 2a). There are also a range of types of group and ways that participants can access the activities. Different combinations of these elements create different models for linking NFM/SuDS with volunteering, community engagement, Nature Based Interventions and Green Social Prescribing (Figure 2b-e).

Figure 2a. Combinations of activities, referral pathways and group types result in different approaches to linking Natural Flood Management programmes with health. Examples are in figures 2b - e)

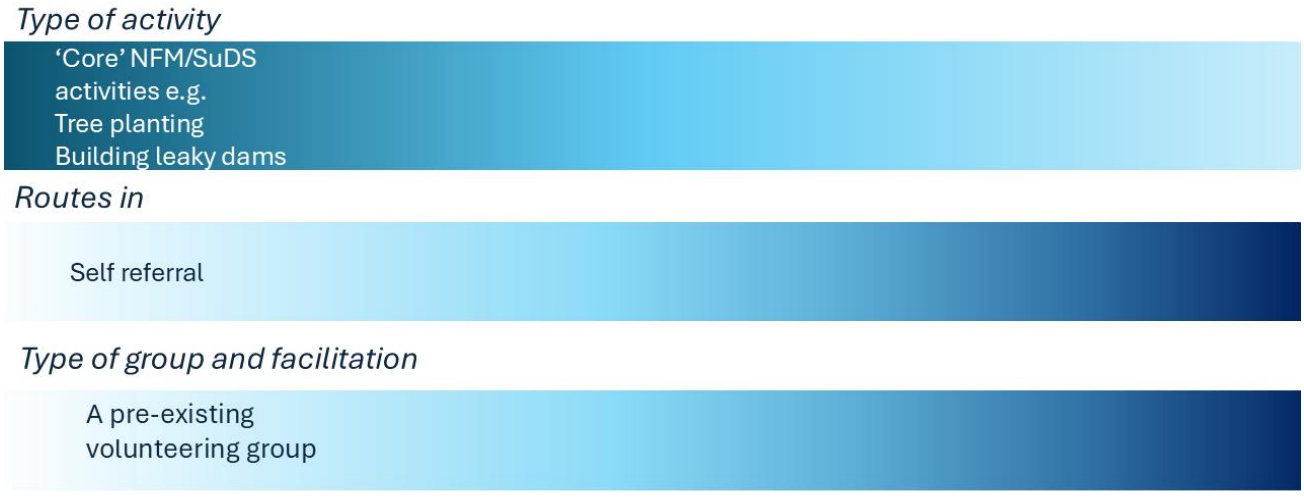

Figure 2b. Conservation volunteering groups carrying out NFM activities could improve access to a wider range of people looking to volunteer to support their health and wellbeing.

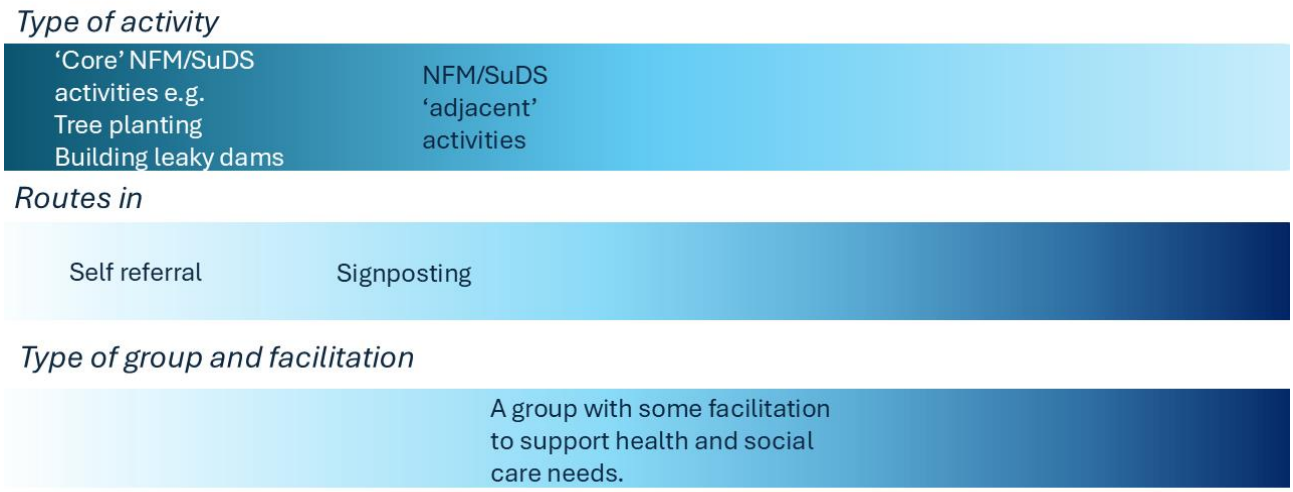

Figure 2c Conservation volunteering carrying out NFM activities could have a particular focus on supporting health outcomes and with links to social prescribers.

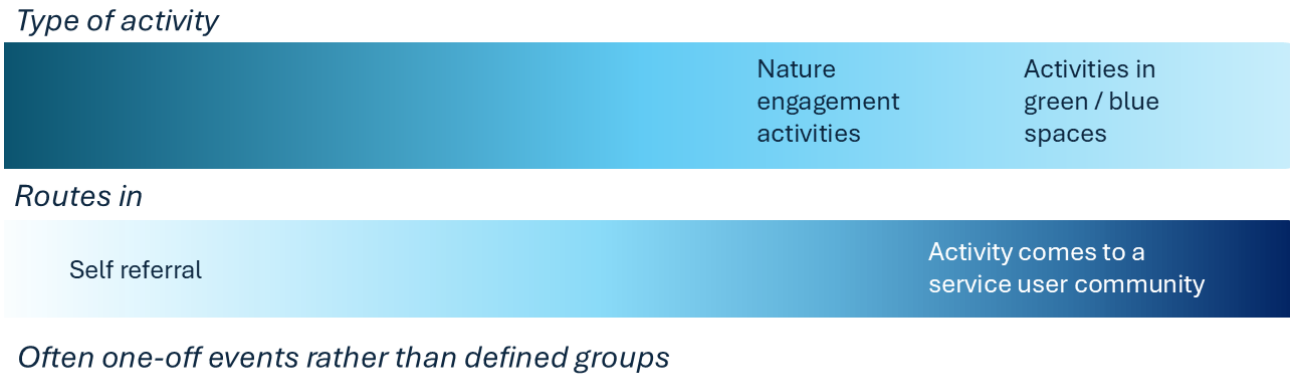

Figure 2d. Community engagement and wellbeing activities connected with an NFM programme, but not delivering NFM activities. This focuses on engaging with communities about NFM and nature connection activities for health, perhaps where people have particularly been impacted by the mental health impacts of flooding.

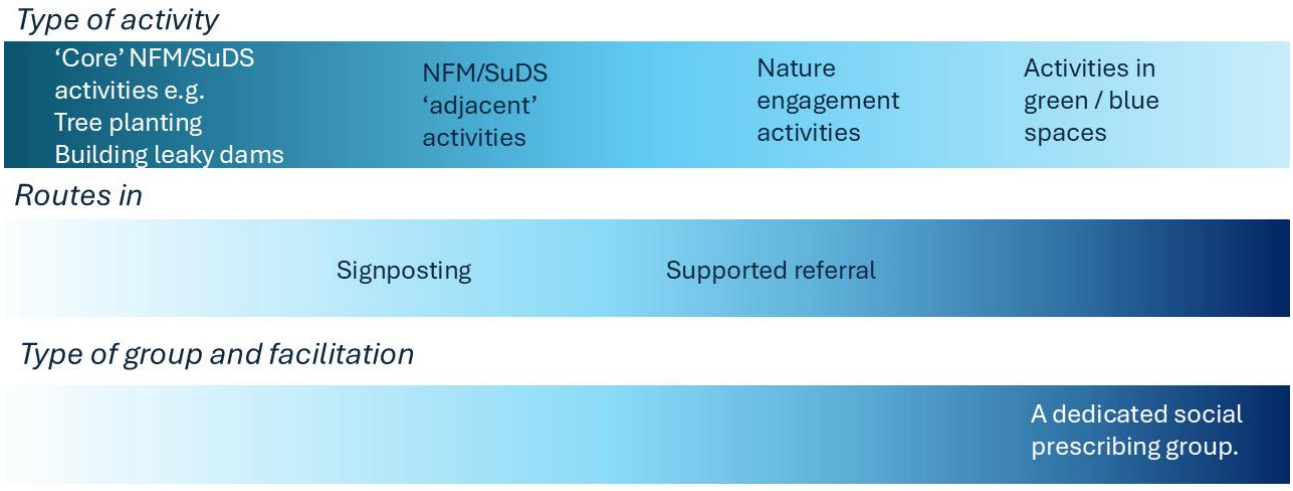

Figure 2e. Example of a green social prescribing programme delivering NFM and a range of related nature engagement activities.

Implications for the development of NFM, SuDS and GSP

The interviews and workshops suggest that the term 'Green Social Prescribing' is starting to be used to apply to any project with health and wellbeing aims, as nature-based organisations adapt themselves around the changing priorities and language being used in the public sector. The lack of formal GSP pathways mirrors findings from the evaluation of the Humber and North Yorkshire Defra test and learn pilot, where the vast majority of participants were self-referred, even for projects specifically set up as Green Social Prescribing (Darcy et al. 2023, Haywood et al. 2024). This is not necessarily a problem if these activities are contributing to health and wellbeing and support preventative community-based healthcare. However, it does highlight a disconnect between nature-based activities and the developing social prescribing 'infrastructure' that could result in health inequalities becoming further entrenched if there are barriers to self-referral (Garside et al. 2020). There may be a tendency for nature-based organisations to be oriented towards broader health and wellbeing benefits for volunteers and local populations from green and blue spaces. Social prescribers and some health-based organisations may be more focused on the therapeutic aspects of specific Nature Based Interventions for individual service users.

Comparison with other nature-based activities

Compared with NFM and related volunteering, other nature-based interventions for health are lower risk, lower cost and have lower barriers for access and delivery. Gardening projects in particular are likely to be more easily understandable and appealing for health trained staff. The contribution to local greenspace seems more tangible and is likely easier to evidence and publicise than work to deliver nature-based solutions, even though NFM related activities are likely to have broader scale and long lasting positive societal impacts. However, NFM related activities delivered through GSP might be more appealing and provide more opportunities to contribute for people from demographics and communities not currently reached by more widespread horticultural projects. NFM and related activities potentially offer pathways into longer term volunteering and skills development, and could be offered as part of a wider programme of nature-based and therapeutic activities.

Recommendations and proposed next steps

An email list of organisations involved in, or interested in, this work package who wished to maintain contact has been circulated among participants, along with resources. These organisations should continue to be consulted and given opportunities to be involved in codesign.

Airedale

An outline proposal has been submitted to Natural England, should future funding become available from WYCA. The proposal has had input from the Aire Rivers Trust and is intended to stimulate discussion and further project development.

There is interest from the Occupational Therapy service within Bradford District Foundation Trust in developing collaborations with the Aire Rivers Trust for Nature Based Interventions in the Shipley area. There may also be potential for collaborative work in Keighley connected with an NHS horticultural green social prescribing group and local volunteer organisations caring for blue spaces.

Piran White and Laura Harrison are in receipt of funding from Natural England Jan - March 2025 in collaboration with Bradford District Care Foundation Trust. The research will test a process for using publicly available tools and data to identify priority areas in Bradford to focus on nature based solutions for health and nature recovery outcomes. There might be particular opportunities in Bradford for GSP and public health projects that connect with the delivery of Sustainable Drainage Systems.

In Leeds, Samuel Ramsden and Laura Harrison are continuing discussions with Meanwood Valley Urban Farm around Green Social Prescribing and communicating about climate change and flood risk with people with health and social care needs. There are also potential links with third sector organisations who have been recently funded by Climate Action Leeds for nature recovery and health and wellbeing projects.

Calderdale

There is already a well-developed programme of NFM related volunteering opportunities in Calderdale. Those organisations who wish to expand their intake of volunteers and have a greater emphasis on health and wellbeing outcomes would benefit from stronger connections with Staying Well workers within the Calderdale Community Anchor network.

Kirklees

Ongoing work should maintain connections with the developing Natural Flood Management and health and wellbeing project being led by Kirklees Council. Approaches to the evaluation of health and environment outcomes has been a particular area of discussion.

Other areas

Future work should also consider extending into geographical areas beyond the scope of this feasibility study: Wakefield, Upper Aire/Craven District and the Lower Aire.

Future work should also maintain connections with the Ousewem programme (North Yorkshire), provider organisations in Greater Manchester through connections with the Green ME programme and provider networks in Humber and North Yorkshire (maintained by HEY Smile Foundation).

Other project outputs

A poster on Natural Flood Management and Green Social Prescribing was presented at the Bradford HOPE (Hope for People and Planet Entwined) conference 7th November 2024. A presentation was given at the iCASP confluence on the 26th February 2025. An academic paper is in development.

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