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An Investigation into the Relationship Between Greenspace Availability and Wellbeing in Leeds

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An Investigation Into The Relationship Between Greenspace Availability And Wellbeing In Leeds

By

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Abstract

Creating a multifunctional greenspace in urban areas is crucial in ensuring communities have equal access to outdoor space, however, the extent of the role greenspace can play in improving wellbeing is uncertain, with the subjectivity of the term leading to some uncertainty. As research into the close links between physical and mental wellbeing and greenspace continues to emerge, there has been an increased awareness and encouragement by policy makers such as the UK Government to interact with these areas, with a suggestion that a number of social, recreational and environmental benefits can be gained. These benefits are evident when examining the role of urban greenspace in Leeds, where the local council has created the 'Parks and Green Spaces Strategy', which aims to maintain and promote the use of urban greenspace, and ensure that all audiences have an equal access. Through conducting an online questionnaire and in-person interviews, this project considers how a non-technical audience such as the general public define "greenspace" and "wellbeing" to examine a spaces purpose, and the potential benefits that can be provided. Results have shown that greenspace is a vegetated area such as a park or open space, with some consideration of rural areas of farmland. It is also clear that the COVID-19 pandemic has influenced the use of greenspace, with participants acknowledging the benefit these areas can have, and the ability a greenspace has in creating an 'escape'. It is clear that there must be a continued engagement with individuals, to ensure that people are aware of the mental and physical benefits that can be gained from interacting with a greenspace, to ensure that these areas are appropriately designed, and effective elsewhere.

Key Words: Greenspace, Green Infrastructure, Sustainable Drainage Systems, Wellbeing, Health

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List of Acronyms

Acronym	Description
ART	Attention Restoration Therapy
BGI	Blue-Green Infrastructure
COVID-19	Coronavirus-19
CSOs	Combined Sewage Overflows
DEFRA	Department for Environment, Food and Rural Affairs
GI	Green Infrastructure
LGS	Local Green Space designation
LPQ	Leeds Quality Park Values
NbS	Nature Based Solutions
NCI	Nature Connection Index
NGO	Non-governmental Organisation
NPPF	National Planning Policy Framework
ONS	Office for National Statistics
PM	Particulate Matter Pollution
SuDS	Sustainable Drainage Systems
UHI	Urban Heat Island Effect
WEMWBS	Warwick-Edinburgh Mental Wellbeing Scale
YEP	UK Government's 25 Year Environment Plan

1.0 Introduction

Since the rise in formal public parks through to the most modern concepts of urban and rural greenspace, it has become apparent that connecting with nature is vital, benefitting both people and the environment (Li & Zhou, 2019, p. 256). As introduced in the National Planning Policy Framework (NPPF), areas of open space should be taken into account when planning and developing new infrastructure, with an acknowledgement that protecting greenspace can enhance an area (Ministry of Housing, Communities and Local Government, 2021). The Local Green Space designation (LGS) recognises that greenspace and areas of common land in towns and cities are areas which communities highly value, due to their ability to improve mental health, and promote physical exercise (OSS, 2023). Having access to common land in urban areas not only ensures individuals can receive these benefits, but allows for communities to have an equal access to free greenspace, which is of particular importance in areas where greenspace may be limited (Friends of the Earth, 2020). England's greenspace gap has been briefly acknowledged in the literature, with a recognition that there is a marked disparity in access to greenspace when comparing those in rural and urban areas, however there still remains a lack of awareness surrounding the necessity for reducing this inequality (Mears *et al.,* 2019, p. 126).

With sustainable practices such as greenspace, green infrastructure (GI) and Sustainable Drainage Systems (SuDS) able to provide multiple benefits extending beyond flood management, the implementation of these solutions has become preferred (Mell, 2017, p. 137). This is evident when considering the encouragement for solutions like SuDS, with it likely that this technique will become a greater part of modern cities, due to their ability to reduce flood risk, while maintaining and improving water quality and biodiversity (Green, 2019, p. 71, O'Donnell *et al.,* 2017, p. 3). Investigating the extent to which these solutions can improve health and wellbeing is therefore key, to ensure that water utility companies, councils and stakeholders consider the versatility of SuDS, as opposed to conventional methods of drainage (O'Donnell *et al.,* 2017, p. 4).

The benefits of solutions such as SuDS and GI are evident when considering the links between the natural environment and improved mental and physical wellbeing. Much of the literature is beginning to consider the importance of health and the potential that interacting with greenspace has on improving an individual's quality of life, this is particularly evident when considering those living in urban areas (Barton & Rogerson, 2017, p. 80). Where greenspace is limited, which is typically the case in densely populated areas, it is vital to ensure that individuals have access to outdoor space (Browning *et al.*, 2022, p. 2). Urban greenspace provides an opportunity to deliver a number of protective health benefits, reducing an individuals exposure to environmental stressors such as air, light or noise pollution (Markevych *et al.,* 2017, p. 301). As a result, an individual may experience an improved

mental or physical state, with greenspace promoting communities to interact with nature, and build a relationship with an environment outside of work, education or personal commitments (Ekkel & Vries, 2017, p. 215). The number of benefits green solutions can provide are evident in Figure 1, which reiterates the role greenspace can play in promoting health in an urban area (Browning *et al.,* 2022, p. 5).

Figure 1.

Benefits of Green Solutions

From (Hartley, 2020)

With the prevalence of cardiovascular disease, depression and anxiety becoming a concern to public health, there has been an increase in studies regarding the role of greenspace and the potential benefits associated with the natural environment (Jabbar *et al.,* 2021, p. 4407). By viewing elements with a greenspace such as vegetation or wildlife, there is an opportunity to gain a restorative benefit, by improving an individuals ability to pay attention and concentrate on day-to-day activities such as chores or work responsibilities (De Keijzer, 2020, Soga *et al.*, 2017, p. 92).

An increasing awareness among researchers and health practitioners reiterates this, highlighting the importance of human-nature interactions, and the potential benefit it can provide to wellbeing (Soga *et al.*, 2017, p. 95). Mental health conditions cost the UK economy an estimated £70-£100 billion annually, representing 4.5% of gross-domestic product (GDP), with poor mental health representing the largest cause of disability across the UK (Mental Health Foundation, 2022, Natural England, 2016). City living has increased the risk of poor mental health, with a suggestion that the risk of developing

depression, which is the most prevalent mental health condition is 20% more likely, when comparing to those living in rural areas (Mechelli, 2019). With health systems unable to respond quickly enough, there is considerable inequality between those needing treatment and receiving it. Subsequently, this has led to an increase in mental health conditions, with many unable to seek adequate treatment (De Keijzer, 2020). Greenspace provides a unique opportunity to improve mental and physical health, by encouraging individuals to connect with nature and wildlife, potentially reducing feelings of anxiety and stress (De Keijzer, 2020). The potential benefits greenspace provide are of particular importance, which is clear when considering the ability outdoor space has in providing cost-effective methods of health intervention (Barton & Rogerson, 2017, Public Health England, 2014, p. 5). Programmes such as Ecominds have estimated that through reduced NHS costs and increased tax contributions, nature-based solutions for health can result in savings of £1.46 million when calculating the cost for 246 individuals alone (Natural England, 2016). With the cost benefits in mind, the importance of encouraging individuals to interact with greenspace continues to increase, with the literature highlighting the ability that outdoor spaces have on reducing anxiety, depression, cardiovascular disease, and degenerative illnesses, such as dementia and arthritis (Mmako *et al.*, 2020, p. 1). Despite the evidence of health benefits, there are few studies which consider what elements of greenspace influence wellbeing. The term "wellbeing" is relatively subjective, which has led to multiple interpretations making it difficult to consider if greenspace provides equal benefits to everyone (Bell *et al.*, 2017, p. 94). The issue of what constitutes "wellbeing" in the context of greenspace is covered in Chapter Two, Section 2.6.

With a focus on larger sized cities in the UK, typically located in the Midlands or South West, there is a need to investigate the role of greenspace elsewhere, to investigate whether the same benefits are provided (Barker *et al.*, 2019a, p. 496). However, it is clear that greenspace in urban areas is under-researched, despite the fact that the UK Government continue to encourage the development and use of these spaces.

Leeds, West Yorkshire, is one example of a medium to large-sized city where a Parks and Green Spaces Strategy has been implemented, in an effort to maintain the use of, and encourage interaction with greenspace (Leeds City Council, 2022). This is significant, as the strategy highlights the role greenspace can play in creating a multifunctional space, benefiting both people and nature (Ministry of Housing, Communities and Local Government, 2021, p. 12). The strategy also recognises the influence of the coronavirus pandemic (COVID-19), and the role this has had in increasing interaction with greenspace, claiming that individuals subsequently appreciated the value of urban public greenspace (Leeds City Council, 2022). It is important to consider whether individuals' health and wellbeing have benefitted from interacting with greenspace, particularly as much of the literature suggests that the availability

and access to outdoor space is vital in reducing the pressure on mental health services (Barton & Rogerson, 2017, p. 80).

Interacting with greenspace also links with the role of greenspace accessibility, which has been considered as one of the key barriers to preventing individuals from using outdoor spaces (Taylor & Hochuli, 2017, p. 26). Cost and the location of greenspace e.g.,, greenspace outside of a city centre or paying admission to enter a site, has led to some public spaces being inaccessible (Browning *et al.,* 2022). The location of Leeds is important when considering greenspace accessibility, as the city is near the Yorkshire Dales and the Peak District, therefore it is often assumed that individuals will travel to areas outside of the city centre (Mears *et al.,* 2019, p. 129). However, with poor public transport links and the cost associated with reaching these areas, these spaces remain inaccessible for some, for example for those with disabilities (Grinspan *et al.,* 2020). There consequently needs to be a consideration of the role of urban greenspace specifically and its purpose, to examine whether it can influence mental or physical health (Barton & Rogerson, 2017, p. 82). Without investigating the role of greenspace, there not only remains a difficulty in encouraging individuals to interact with greenspace, but also an uncertainty surrounding what it is about a greenspace that provides an added benefit.

To encourage the use of greenspace, there must be a greater consideration of how individuals define the term to examine whether this influences its purpose, and the potential benefits outdoor space can provide. By investigating how individuals define “greenspace”, it also ensures that those planning and developing a space implement an effective design which individuals find most beneficial (Braubach *et al.,* 2017, p. 190). While the literature has begun to consider the link to physical and mental health, there is very little understanding of the specific functions within a greenspace that influence wellbeing and quality of life, therefore this must be investigated in greater detail (Cohen-Cline *et al.,* 2015, p. 525). Furthermore, despite the literature praising the increase in the development of greenspace, there are multiple issues that remain, with an uncertainty surrounding the definition of the term (Taylor & Hochuli, 2017, p. 26). Creating a criterion which outlines what constitutes as greenspace is vital in encouraging uptake of these areas, which will in-turn ensure that all greenspace created is implemented effectively (Barton & Rogerson, 2017, p. 79).

1.1 Project Structure

The research project will follow the structure outlined below:

- Chapter Two – Literature Review

Examination regarding how “Greenspace”, “Green Infrastructure” and “Sustainable Drainage Systems” are defined. An investigation of what wellbeing is, and a consideration of how this relates to greenspace.

Research ‘gaps’ within the field were also identified.

- Chapter Three – Methodology

Outline of the research design and an explanation of the methods undertaken throughout the project and a justification of these. There are also details of Leeds, the study sites chosen, and their appropriateness.

- Chapter Four – Results and Discussion

Analysis of the results collected and a consideration of how individuals define “greenspace” and the influence the questionnaire had on responses.

An investigation into the purpose of greenspace and the influence this has on accessibility.

Evaluation of the benefits of greenspace and the influence this has on physical and mental wellbeing.

- Chapter Five – Conclusion, Future Study Opportunities and Limitations

An overview of the key findings, the recommendations and limitations of the project. There is also a consideration made to the influence of this project and the future opportunities it can provide.

2.0 Literature Review

2.1 Introduction

As discussed in Chapter One, there is a clear need to investigate the definitions associated with greenspace, GI and SuDS, to begin to consider the potential role that solutions to flood risk can have on an improved mental and physical state (Rugel, 2015, p. 2). Techniques like GI, Nature based Solutions (NbS), and SuDS have been increasingly considered, with each solution able to offer an approach which can utilise the natural processes of the hydrological cycle, which are often disregarded when using conventional drainage methods (Green, 2019, p. 72). The benefits of these solutions closely link with several ecosystem services that can be provided by greenspace, as evident in Figure 2. These services provide a benefit to individuals while playing a key role in maintaining physical and mental health and wellbeing (Balvanera *et al.,* 2016, p. 41). Investigating the benefits that can be gained also allows consideration of the social and economic opportunities these systems could provide, which must be explored (Office for National Statistics, 2021a, Green, 2019, p. 73).

Figure 2.

From BDG (2017).

Defining greenspace is crucial when considering the effects of climate change and urbanisation which continue to increase, both reiterate the necessity for implementing and encouraging green solutions, which can mitigate the effects of these (Kourtis & Tshihrintiz, 2021, p. 2). Furthermore, unlike SuDS, conventional methods of drainage fail to provide a function beyond reducing water quantity, therefore alternate methods should be considered, to allow for multiple benefits to water quality, biodiversity, and recreational value (Kourtis & Tshihrintiz, 2021, p. 3, O'Donnell, 2016). SuDS can therefore become a key tool when considering the design of future developments in water-sensitive cities, with the philosophy of the technique ensuring that the solution replicates the predevelopment catchment hydrology, generating wider benefits such as amenity and biodiversity gains (Melville-Shreeve *et al.,* 2017, p. 12). With this in mind, there is a clear opportunity for these techniques to ensure an outdoor space can be multifunctional, providing a range of social, recreational and environmental benefits (Roberts *et al.,* 2022, p. 12). These benefits can be provided on both a small scale to communities, and also on a wider-scale, when considering how multiple greenspaces can create GI, and connect spaces across different towns and cities (Roberts *et al.,* 2022, p. 10).

The importance of these systems has been further reiterated when considering the influence of the COVID-19 pandemic, which has encouraged individuals to interact more frequently with greenspace (Heo *et al.,* 2021, p. 2). As a result of the associated lockdown restrictions that were implemented across the UK, individuals were encouraged to interact with greenspace as it was one of the few places they could visit (Burnett *et al.,* 2021, p. 1). Interacting with nature during the COVID-19 pandemic has resulted in a greater appreciation for these spaces, and the benefits they can provide (Burnett *et al.,* 2021, p. 5). Literature suggests that exposure to the natural environment can enhance health and wellbeing, however few consider how an individual's understanding and awareness of GI, greenspace and SuDS may influence this (Mell, 2017, p. 137). Therefore, this chapter will consider how literature defines GI, Greenspace and SuDS, to understand how non-technical audiences utilise these spaces, and consider the influence this may have on their mental and physical wellbeing (Heo *et al.,* 2021, p. 2).

2.2. Greenspace

To consider the role that greenspace may have on influencing wellbeing, the definitions that will be considered are listed below in Table 1. An initial search was undertaken using SCOPUS to identify the most relevant literature, using the search terms "Green Infrastructure", "Blue-green infrastructure", "Greenspace" and "Sustainable Drainage Systems" in the title, abstract or keywords. The terms associated with the definitions listed below are the most frequently used throughout the literature considering the health and wellbeing benefits associated with greenspace. Terms such as "allotments" and "nature reserves" were considered, however few papers appeared. The papers outlined in Table

1 were most commonly referred at the time of searching SCOPUS, and provided a clear definition of what greenspace is. An outline of the process of developing the literature review can be seen in Appendix A.

Table 1.

The most popular definitions of "greenspace" referred to on SCOPUS, when considering health and wellbeing. Please note this is not a definitive list of papers relating to greenspace, GI, BGI and SuDS

	Vegetated Area of Land	Urban Area	Rural Area	Park	Allotment	Nature Reserve	Woodland
Browning *et al.* (2022)		X	X	X			X
Clark (2021)	X	X	X				
Taylor & Hochuli (2017)	X	X	X	X		X	X
Barton & Rogerson (2017)	X	X		X		X	X
Braubach *et al.* (2017)		X		X			
Bell *et al.* (2017)		X	X			X	

Note. The list of papers focuses on the most referenced literature that clearly defined "greenspace" at the time of writing. While the term "allotment" was considered, no paper clearly defined the term, therefore it was not used when considering types of GI, to avoid confusion. As mentioned, this is not a definitive list of papers on GI/BGI and greenspace, with a focus placed on papers with more than 50 citations.

Most of the literature in Table 1 defines greenspace as a vegetated area that can be in an urban or rural space, providing some form of 'added benefit' (Clark, 2021, p. 11). One of the most detailed considerations was provided by Barton & Rogerson (2017), who considered greenspace to be used as an umbrella term, defining these spaces as maintained or unmaintained environmental areas (Clark, 2021, p. 14, Barton & Rogerson, 2017, p. 80). As well as providing a definition of the term, the paper also provided suggestions of what is classed as an urban greenspace, including nature reserves, urban parks, and wilderness environments (Clark, 2021, p. 12). By providing a clear definition and a list of example areas which were considered as greenspace, it allowed these areas to be easily identified when considering the role they have in influencing individual's health and behaviours (Barton & Rogerson, 2017, p. 81). A focus remained on the therapeutic benefits the natural environment can provide, with greenspace considered to improve cognitive ability and productivity, as well as lowering levels of stress and anxiety (Masterton *et al.,* 2020, p. 2). It was suggested that accessibility is key to

ensuring that a benefit is provided by greenspace, with those living near and engaging with outdoor space receiving a greater benefit, in comparison to those who do not have access (Barton & Rogerson, 2017, p. 80). The importance of both urban and rural greenspace was reiterated throughout the research, with it being clear that individuals have a desire to interact with nature, however the reasoning behind this was unclear (Barton & Rogerson, 2017, p. 85).

With an increase in challenges associated with climate change and urbanisation, Braubach *et al.* (2017), has outlined the key role greenspace can have in sustainably using natural resources such a greenspace to enhance natural capital, and benefits individuals health and wellbeing (p. 6). The role of urban greenspace was also considered by Braubach *et al.* (2017), who examined the link between social cohesion, physical activity and interacting with nature (p. 2). Examples of urban greenspace were provided, with parks, playgrounds and residential greenery mentioned (Braubach *et al.,* 2017, p. 3, Moseley, 2013, p. 4). The paper was clear in highlighting the importance of appropriate design, maintenance, and operation of greenspace, although no reference to a link with social cohesion and physical activity were provided (Aspinall *et al.,* 2013, p. 1). It is evident that an emphasis in the literature is placed on urban greenspace, as opposed to equally considering the role of rural areas, due to the limited amount of open space in densely populated areas (Jabbar *et al.,* 2021, p. 4409). An unequal consideration is likely a result of a juxtaposition of the space being considered (Xu *et al.,* 2021, p. 2). Unlike in urban space where there are clear 'clashes' between grey infrastructure and greenspace, rural areas do not have this as much of the space is undeveloped, alongside a low awareness of whether footpaths and fields are publicly accessible (Xu *et al.,* 2021, p. 3). It possible that this therefore affects peoples mindset towards what constitutes as a greenspace, resulting in a greater focus on urban areas, where the identification of outdoor space is easier (Alves *et al.,* 2019, p. 244).

The transition from green to grey structures has reiterated how the natural environment has been restricted or removed in urban areas, despite the fact that social and recreational benefits can be gained (Helbich *et al.,* 2018, p. 292). The implications associated with removing greenspace has been considered by Taylor & Hochuli (2017), who placed a focus on the role of urban space, due to its crucial role in providing accessibility to nature for all (p. 27). Urban greenspace was considered to be an area comprised of vegetation and associated natural elements; with this study was one of few to recognise the number of definitions associated with defining "greenspace" (Taylor & Hochuli, 2017, p. 30). It was suggested that because of multiple disciplines studying the role of these areas (e.g., medicine, sport and social sciences), different interpretations of greenspace have arisen (Taylor & Hochuli, 2017, p. 26, O'Donnell, 2019, p. 29). Not only has this led to a variation in definitions associated with greenspace, but it has resulted in a wider struggle with linking the findings of each discipline together, due to a wide range in potentially related, but different findings relating to greenspace (Taylor & Hochuli, 2017,

p. 28). With the language relating to greenspace considered ambiguous, Moseley, (2013), has suggested that it can be difficult to apply each discipline's definition of the term to actual examples (p. 2). With these papers in mind, it is evident that there must be an interdisciplinary approach to defining greenspace, to ensure that each disciplines' findings can be linked, and clearly understood. Taylor & Hochuli (2017) made an initial step in achieving a set of criteria, linking papers relating to greenspace based on the size of a greenspace, land use, vegetation type and density, which helped to gain a greater understanding of the link between the different aspects of a greenspace (Sprague *et al.,* 2022, p. 600). Creating a basic criterion has been significant in beginning to encourage disciplines to classify and define greenspace similarly, however there must be a greater investigation into the different elements that constitute a space as green e.g., location, vegetation density (Taylor & Hochuli, 2017, p. 29, Moseley, 2013, p. 5). This is necessary, as it will ensure that those developing and encouraging the use of greenspace share an equal understanding and can effectively implement functional greenspace (Braubach *et al.,* 2017, p. 188).

The difficulty in interpreting the role of urban greenspace was further recognised when considering how the term has developed overtime, with some literature using greenspace as two words, which can potentially change the meaning of the term (Taylor & Hochuli, 2017, p. 26). For example, it is suggested that most papers use "greenspace" as one word, closely linking to an area being "urban" or "public" (Taylor & Hochuli, 2017, p. 28). When using the term as one word, it is also suggested that there is a variation in what is considered as "greenspace", as it could be a multitude of areas e.g., parks, gardens, allotments etc. (Sprague *et al.,* 2022, p. 600). Whereas with "green space", the use of "green" is used as a adjective, and considered a synonym for vegetation (Houlden *et al.,* 2018, p. 3). Using the term as two words therefore suggests that any space with a green appearance is greenspace, however this is problematic as there are greater associations with the colour of a space, as opposed to the vegetation present (Ives *et al.,* 2017, p. 5).). This could potentially lead to some areas being excluded e.g., harvested allotments, farmland or areas that contain bodies of water (Taylor & Hochuli, 2017, p. 29). While this approach was confusing, the difference between some papers referring to greenspace as one word, as opposed to two separate words reiterates how ambiguous the term "greenspace" can be, potentially explaining why there are multiple interpretations (Escobedo *et al.,* 2019, p. 3). This not only makes promoting the use of greenspace challenging, but can also lead to difficulties in implementation, if developers and academics have differing views as to what constitutes greenspace (Ives *et al.,* 2017, p. 3). This highlights a need to provide a single definition or set of criteria which provides a basis for research involving greenspace so that those involved in developing and promoting greenspace e.g., academics, developers, environment agencies and NGOs have the same level of understanding (Moseley, 2013, p. 3).

By considering greenspace as 'urban', it implies that there is also rural greenspace, however few papers clearly state the difference between the two, with a greater emphasis placed on urbanised areas (Taylor & Hochuli, 2017, p. 26). Browning *et al.,* (2022) was one of few who has placed a focus on the role of rural greenspace, and the influence it can have on an improved physical health (p. 4). It was suggested that rural greenspace can improve health to a greater extent due to an increased accessibility to outdoor areas in the outer suburbs and countryside (Browning *et al.*, 2022, p. 4). Whilst urban and rural greenspace were considered together, no definition of the term was provided, with little clarification surrounding how greenspace is classified as either rural or urban (Browning *et al.,* 2022, p. 5-6, Gascon *et al.,* 2016, p. 61). While it is important to also think about the role rural greenspace can have in improving health, there must be a greater consideration of how these spaces can be identified, to ensure equal consideration (Browning *et al.,* 2022, p. 6).

The concept of "blue space"' has also been proposed which includes areas such as lakes, canals and ponds, typically existing alongside greenspace (White *et al.,* 2020, p. 2). Bell *et al.* (2017) proposed the idea that landscapes should not be considered as just green, highlighting the need for a criteria which considers how to define different types of open spaces (p. 93). Despite the paper considering that natural environments can extend beyond green space, no clear definition of "blue space" was provided, leading to the assumption that 'blue' only refers to water, despite the fact that much of the literature consider elements such as lakes and ponds as part of a greenspace (White *et al.,* 2020, p. 4, Foley, 2017, p. 44). Without a clear definition and understanding of these green and blue spaces, encouraging uptake of these solutions is difficult, as non-technical audiences e.g., the general public, are unaware of the potential benefits these solutions can provide (Taylor & Hochuli, 2017, p. 27). While the public do not have direct control over the implementation of these solutions, they interact with blue and green space, therefore there is a need to understand how these spaces are utilised, to ensure they are designed effectively (White *et al.,* 2020, p. 5).

2.3 Green Infrastructure (GI)

It has been close to 30 years since GI has been actively discussed by both academics and developers, and as the implementation of GI is further encouraged, it has led to various definitions of the term being adopted (Zuniga-Teran *et al.,* 2019, p. 712, Baro *et al.,* 2015, p. 1). Like the increase in research relating to the necessity for greenspace, research involving GI has also been driven by increasing interest surrounding the importance of biodiversity, and climate resilience in urban areas (Taylor & Hochuli, 2017, p. 26, Mell, 2017).

Similar to the variation in definitions surrounding "greenspace", it is clear that there are also multiple interpretations of GI, further complicating the literature surrounding green solutions. The most used

definition of the term was considered by Nieuwenhuijsen (2021), who defined GI as an interconnected network of greenspace (Figure 3) that preserves the natural environment while benefitting the surrounding human population (p. 317). This definition recognised that understanding of GI vary, suggesting that often, GI and greenspace are not clearly referenced separately, which has led to some confusion, as they can be used interchangeably (Nieuwenhuijsen, 2021, p. 318, Dennis *et al.*, 2020, p. 2). While it was recognised that GI is essential in ensuring urban areas can adapt to the effects of climate change, it is evident that there must be clear definitions of both GI and greenspace, to ensure the terms are used correctly (Nieuwenhuijsen, 2021, p. 319). Nieuwenhuijsen (2021) also considered the ability GI and greenspace have in providing "ecosystem services" such as improving air quality and providing a space for recreation, which can support human health and wellbeing (Nieuwenhuijsen, 2021, p. 318, European Environment Agency, 2021). This was not only significant in highlighting the social benefits GI can provide, but also reiterated the ability that the natural environment can have on improving health, which is increasingly being considered throughout the literature (Nieuwenhuijsen, 2021, p. 318, Coutts & Hahn, 2015, p. 9769).

Figure 3.

A Network of Green Infrastructure

From Yeo *et al.* (2022, p. 2)

This definition of GI provided in Figure 3 is similar to that which is provided by the NPPF, which sets out the UK Governments planning policies and requirements for England (Ministry of Housing, Communities and Local Government, 2021, p. 8). GI is also considered as a multifunctional space, that can provide environmental, economic, health and wellbeing benefits to both people and nature (Ministry of Housing, Communities and Local Government, 2021, p. 12). When GI is spoken about from a planning perspective, a clear definition of the term allows local councils to effectively implement this practice, providing a basis for developers to follow (Leeds City Council, 2021). The approach of the

NPPF requires local authorities to develop plans, however there is little mention of whether communities are consulted during the planning and/or implementation stages of this process (Upton, 2019, p. 136). If communities are not involved, this highlights a potential issue with the framework, as local authorities and policy makers are not considering how the development of GI schemes may affect individuals, or what features they find to be most beneficial (Upton, 2019, p. 138).

Despite the NPPF clearly defining GI, it must be considered that this was only in relation to city planning, with the literature indicating that elsewhere GI is interpreted differently, suggesting that the term is subjective (Nieuwenhuijsen, 2021, p. 318, Leeds City Council, 2021). Grabowski *et al.* (2022) considered this and was one of few to acknowledge that the term GI is context-dependent (p. 152). The paper investigated the role that GI has in managing stormwater, suggesting that this solution can provide a range of benefits that extend beyond flood management (Grabowski *et al.,* 2022, p.152, Catford *et al.,* 2022, p. 158). The definition of GI by number of disciplines (see Table 2) was also examined, further highlighting that each defines the term slightly differently (Baro *et al.,* 2015, p. 1). An example included the use of GI in ecology, which considers the technique as a network of ecological elements that provide multiple functions, which differs from the definition used in planning, which places an emphasis on social interaction (Grabowski *et al.,* 2022, p.153, Zhou *et al.,* 2019, p. 27). Grabowski *et al.* (2022) failed to highlight the difficulties this may cause when encouraging the development of GI in urban areas, as multiple definitions of the term may lead to confusion surrounding what GI is, particularly where multiple disciplines are involved (Grabowski *et al.,* 2022, p. 152, Szulczewska *et al.,* 2016, p. 177). Grabowski *et al.* (2022) briefly mentioned that future research should be informed by a new broader definition of GI that includes both ecological and social benefits, however it was unclear how this could be achieved.

Table 2.
Definitions of Green Infrastructure

Discipline	GI Definition
Planning	No explicit definition – GI is linked to stormwater management and benefits to social interaction and the economy.
Ecology	An interconnected network of ecological elements that provide multiple functions to biodiversity.

Adapted from Grabowski *et al.* (2022)

The number of definitions relating to GI continues to present an issue, particularly as the concept becomes increasingly popular, resulting into interpretations and the purpose of GI changing, depending on where its geographic and disciplinary context (Matsler *et al.,* 2021, p. 2). This presents

an issue, with multiple interpretations of GI potentially challenging successful implementation, as projects may meet the expectation of urban planners, but not those of engineers or architects (Matsler *et al.,* 2021, p. 3). The role of context when considering GI is clearly crucial and must be recognised in order to successfully implement the solution (Matsler *et al.,* 2021, p. 4). It is likely that similar to the views of Baro *et al.* (2015), as GI gains political momentum, and is rapidly introduced into planning policies, it has led to lots of slightly different definitions being created (p. 2). This further complicates the issue, as it is difficult to set out, and create a dialogue between different disciplines to develop a set of criterion or a broader definition relating GI, if policy and GI projects require to be created in quick succession (Matsler *et al.,* 2021, p. 7, Baro *et al.,* 2015, p. 5). While no explicit definition of GI was provided by Baro *et al.,* (2015), this only reiterates the necessity to be explicit and specific about how GI is being defined (p. 1, Mell, 2017 p. 136). Having multiple definitions of GI is considered a key barrier to implementation, as having lots of definitions can be problematic, and can lead to a generalisation by developers that GI practices involve 'anything green', which is not necessarily the case (Baro *et al*., 2015, p. 1). Future research must focus on creating a clear set of criteria which defines the term, providing examples of the techniques and methods that are considered as GI (Grabowski *et al.,* 2022, p.155, Mell, 2017 p. 136). By defining GI, it will allow for a greater focus on the relationship between the environment and built infrastructure, creating criteria that can be applied by each discipline, to ensure GI is implemented effectively (Grabowski *et al.,* 2022, p. 154, Mell, 2017 p. 138). An example where the context of GI was suggested by Matsler *et al.,* (2021), who considered the different definitions of GI to be separated into three categories: greenspace as a planning concept, an urban ecology concept and a water and/or stormwater management concept (p. 2). Creating an outline like this is not only relatively straightforward, with definitions grouped based on discipline, but it ensures that every profession can take advantage of the opportunities GI can create, while addressing the requirements of multiple disciplines simultaneously (Matsler *et al.,* 2021, p. 7).

The role of context in relation to GI is becoming increasingly recognised, with Liao, Deng, & Tan (2017) further suggesting that while GI is a network of open spaces, it can have a different meaning when talking about a specific area. This ideology further supports the issues discussed by Matsler *et al.,* (2021) and Baro *et al.,* (2015). The paper considered that at a local scale, GI specifically refers to sustainable stormwater management features (e.g., rainwater gardens and green roofs), despite initially linking GI to greenspace, causing some uncertainty surrounding what GI is, and how the authors define 'open space' (Liao, Deng & Tan, 2017). Understanding how GI can be context dependent was made more difficult, when considering how the paper had separated practices (e.g., green roofs) away from SuDS, despite the techniques being closely aligned (Liao, Deng, & Tan, 2017, Baro *et al*., 2015, p. 2). This view was novel, with many failing to recognise that despite a clear subjective nature

of GI, it is further complicated when considering its close links to SuDS and greenspace where the terms are being used interchangeably (Catford *et al.,* 2022, p. 158). Ensuring that a clear interpretation is provided will not only prevent this, but it will ensure that the names of each solution are used and referred to appropriately (Maurer *et al.,* 2021, p. 3).

2.3.1 Blue-Green Infrastructure (BGI)

The concept of blue-green infrastructure (BGI) has been introduced to incorporate the 'blue elements' of landscape design such as parklands, swales and ponds, which work with GI (Everett *et al.,* 2021). For urban flood management, this technique is considered significant in presenting a range of opportunities to address the implications of climate change (e.g., increased flooding) and must therefore be considered (Everett *et al.,* 2021, Henderson *et al.,* 2023). Ghofrani *et al.* (2017) recognised the importance of improving the resilience of urban areas in response to climate change, considering the key role BGI has in ensuring this (p. 15). A clear definition of the term was provided, with BGI considered as an interconnected network of natural and designed solutions which include waterbodies and open space (p. 16). The close links to GI were also mentioned, with the paper suggesting that BGI is closely related, and should be considered alongside this technique (Ghofrani *et al.,* 2017, p. 17, Vleeschauwer *et al.*, 2014, p. 1). However, it considered that there were few studies that focus on BGI with much of the literature placing a greater emphasis on GI and the opportunities this solution can provide (Ghofrani *et al.,* 2017, p. 18-19, Henderson *et al.,* 2023). This highlights the importance of equally considering both GI and BGI, particularly as these solutions can both play an important role in dealing with flooding and extreme weather events (Ghofrani *et al.,* 2017, p. 18, Vleeschauwer *et al.*, 2014, p. 2).

The multifunctionality of BGI has been continuously mentioned throughout the literature, with a suggestion that this can provide a "promising route" to ensuring cities can deal with the challenges presented by climate change and urbanisation (Kuitert & Buuren, 2022, p. 2). Brears (2018) has built upon this, considering the ability BGI has in performing several functions in the same area. BGI was defined as a strategically planned network of natural and semi-natural areas, with examples such as green streets and rain gardens provided (Wesener & McWilliam, 2021, Brears, 2018). It has been recognised that unlike traditional grey infrastructure, BGI 'enhances' climate resilience, while also providing economic and social benefits that can benefit a community (Brears, 2018). Multifunctionality is considered a "key aspect" in achieving successful implementation of BGI, with a recognition that the technique can provide benefits to all, unlike conventional methods of drainage which place a focus on reducing and controlling water quality (Fletcher *et al.,* 2014, p. 526). While an emphasis throughout was placed on the multifunctional role that can be provided, there was a clear lack of consideration of the close links between BGI and SuDS, despite the fact that SuDS solutions can be used as part as a

successful design (Hansen *et al.,* 2019, p. 100). There was a clear reluctancy to consider the importance of considering solutions alongside one another, with an emphasis placed on separating solutions, despite them all having the same purpose, to improve water quality, reduce the risk of flooding, and provide a social and ecological benefit (Brears, 2018). This presents a further issue, as without clearly defining each solution, and addressing the equal importance of these, encouraging these practices will be restricted (Brears, 2018, Liao, Deng, & Tan, 2017).

As the management of urban stormwater incorporates more sustainable methods, moving away from traditional methods e.g., combined sewage overflows (CSOs), it is inevitable that this has led to some confusion between the terminology surrounding GI, BGI, SuDS and greenspace (Fletcher *et al.,* 2014, p. 526). This has resulted in a miscommunication when discussing the application of each technique, which could potentially lead to an ineffective implementation (Fletcher *et al.,* 2014, p. 526). The close links between GI, BGI, greenspace and SuDS is acknowledged, and has been examined by Green (2019) who suggested that as a result of all four solutions having a similar purpose, the difference between the techniques is often confused (p. 72). This is made more difficult when considering the number of definitions relating to GI and greenspace, however, no recommendations of how this could be resolved were provided (Green, 2019, p. 73). This reiterates the importance of clearly defining each term, to ensure that the solutions are better understood and effectively implemented (Green, 2019, p. 73, Brears, 2018).

2.4 SuDS

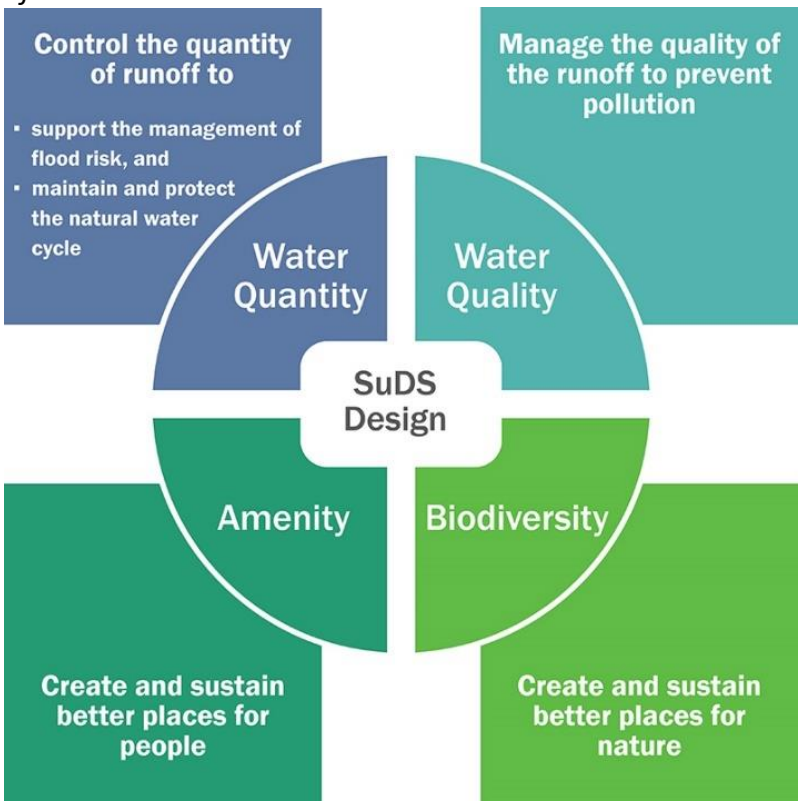
As well as an increased awareness of the importance of GI and greenspace, the literature on SuDS and the multiple benefits this solution can provide has gained an increasing focus (Bastien *et al.*, 2010, 263). To understand why this solution is a preferred method of flood management, the term must first be defined.

The most widely used definition has been provided by the SuDS Manual, which was first published in 2007 and later revised by Woods Ballard *et al.* (2015), to reflect the increasing understanding of this method. Woods Ballard *et al.* (2015) provided a framework for designing and implementing SuDS, defining the term as a solution which maximises the opportunities and benefits surface water management can provide (p.34). SuDS devices were either below or above ground and can either be engineered or built into a landscape (Woods-Ballard *et al.,* 2015, p. 35, Green, 2019, p. 73). Both the 2007 and 2015 publications of the SuDS manual were key to providing a basis for UK SuDS design, and unlike GI and greenspace, by clearly defining the term, it has ensured a greater understanding of what SuDS are by academics and professionals (Forest Research, 2023, Bastien *et al.*, 2010, 264).

There is a clear preference for solutions like SuDS, with the literature continuing to recognise the multiple benefits that can be provided (Zuniga-Teran & Gerlak, 2019, p. 3). Hubert *et al.* (2012) considered the need for SuDS, building on the definition provided by the 2007 version of the SuDS manual, highlighting that the aim of this technique is to mimic the natural drainage of a site as closely as possible (p. 1). A focus was placed on the issues surrounding conventional methods of drainage, which regularly cause downstream flooding, and are unable to cope with increasing urbanisation of previously undeveloped areas (Green, 2019, p. 75, Hubert *et al.,* 2012, p.1). The benefits of using SuDS over traditional methods were considered, with an emphasis on the ability SuDS have in creating a multifunctional area that benefits both people and the natural environment (Fletcher *et al.*, 2013, p. 262, Hubert *et al.,* 2012, p.2). While Hubert *et al.* (2012) was published prior to the most recent version of the SuDS manual, it showed a clear understanding of the purpose of SuDS, which equally prioritise each function that can be provided (Woods-Ballard *et al.,* 2015, p. 33). This suggests why this solution is preferred over conventional methods of drainage, with SuDS able to be designed in a way that can maximise opportunities and benefits, while replicating the natural landscape (Fletcher *et al.*, 2013, p. 261, Hubert *et al.,* 2012, p. 2-3). SuDS can be broken down into four key elements which must be achieved for successful implementation (Woods-Ballard *et al.,* 2015, susDrain, 2023). An overview of the main categories of SuDS design were outlined in the SuDS Manual, as summarised below in Figure 4 (Woods-Ballard *et al.,* 2015, p. 34).

Figure 4.

The Four Pillars of SuDS



The manual references wellbeing, and the role SuDS can have in promoting positive outcomes to health and wellbeing, by creating a space that can be used to create a "liveable environment" (Woods-Ballard *et al.,* 2015, p. 95). A recognition of the social and recreational values SuDS provide is significant, as it highlights not only the benefit to the physical environment (e.g., by reducing water quantity and improving water quality), but also the importance of creating a sustainable environment, that provides a sense of community and feel visually appealing (Woods-Ballard *et al.,* 2015, p. 95).

The number of social and recreational benefits that SuDS can provide are considered one of the key reasons for favouring this technique over conventional methods of drainage, with it clear throughout the literature that these systems can simultaneously benefit individuals and nature (O'Donnell *et al.,* 2018, p. 191). The SuDS Manual (Woods-Ballard *et al.,* 2015, p. 34) was later used by Green (2019), who considered the opportunities SuDS can have in creating a multifunctional area (p.9). SuDS were defined by Green, (2019, p. 72), as a natural form of flood management which is beneficial to both natural biodiversity and the human population. SuDS were considered to promote the development of new greenspaces,

From Woods-Ballard *et al.* (2015)

one of few papers to recognise the close links between these systems (Da Silva & De Souza, 2019, p. 3). Green (2019) was also significant in acknowledging the fact that without considering the 4 pillars equally (Figure 4), the full benefits of SuDS were unlikely to be achieved (p. 9-10). While considering each pillar equally is key to implementation, literature suggests that this is not the case, with a greater acknowledgement of water quantity and quality, making it difficult to promote the importance of biodiversity and amenity value (Lahde *et al.,* 2019, p. 1). In the 2007 SuDS Manual, both biodiversity and amenity were considered as one element, therefore completely separating them suggests that they should now be given equal consideration, however this is not the case (Udale-Clarke, 2015). Despite the recognition that flood management must be dealt with in a sustainable manner, a lack of ability to measure the environmental and social benefits of SuDS can make it difficult to promote the use of these systems and identify the value that can be provided (Lahde *et al.,* 2019, p. 3, Jose *et al.*, 2014). There must be a greater acknowledgement of the interactions between the different elements of SuDS, to better understand the scope of benefits these systems can provide (Woods-Ballard *et al.,* 2015, p. 35).

In comparison to the literature surrounding GI and greenspace, there is less awareness of SuDS solutions by the general public, with a reluctance to implement these methods over conventional

methods of drainage, due to cost, maintenance, ownership and health and safety (Potter & Vilcan, 2020). A greater emphasis is placed on the opportunities greenspace and GI can deliver, which has led to SuDS often being overlooked as a result, despite the principles of SuDS, greenspace and GI closely aligning (Miller & Hutchins, 2017). There must be a greater consideration of the exchanges between these solutions, but also, as suggested in both sections 2 and 3, a criterion which defines each term, to ensure that these practices are undertaken effectively (Taylor & Hochuli, 2017, p. 26, Cosgrove & Loucks, 2015).

It is evident that there is a level of reluctance to group green stormwater solutions together, regardless of the fact that they have a similar aim and purpose (Webber *et al.,* 2022, p. 4). To ensure that the incorporation of techniques like SuDS are encouraged, it is clear that there must be an understanding of the methods close links to other solutions e.g., GI and BGI, as it is possible for SuDS to be incorporated within their design (Webber *et al.,* 2022, p. 5). Williams *et al.* (2019) suggested that SuDS should be considered with GI and BGI, with an acknowledgement of the close links between each of these methods (p. 1). Despite no clear definition of SuDS being provided, the paper assessed the ability SuDS have in providing a multifunctional space in residential areas (Williams *et al.,* 2019, p.7, O'Donnell, 2016). The close links between BGI and SuDS were evident, with the research suggesting that SuDS techniques e.g., swales, are often used and considered as an element of BGI (Williams *et al.,* 2019, p.7, Baptiste *et al.*, 2015, p. 2). It was also evident that non-technical audiences were unaware of the difference between these practices (Williams *et al.,* 2019, p. 8, Barrera *et al.,* 2016, p. 255). Without a greater communication between those developing and encouraging green solutions e.g., UK Government, academics, planners etc, there will continue to be a lack of awareness surrounding the necessity for more sustainable methods of dealing with flood management (Webber *et al.,* 2022, p. 6). This further reiterates the similarities between the techniques, which may be why the practices are often used interchangeably (Williams *et al.,* 2019, p. 4, Baptiste *et al.*, 2015, p. 3).

While an issue, the need to clearly outline solutions labelled as "green" has become apparent, however there continues to be little consideration of how this can be achieved (Webber *et al.,* 2022, p. 5). The issues surrounding implementation has been made by Cotterill & Bracken (2020), who considered the effectiveness of SuDS across the UK, focusing on the multiple benefits this solution has over conventional methods of drainage (p. 2). A clear definition of the term was provided, defining SuDS as a way of replicating the natural environment, while also removing stormwater and excess surface water in a sustainable manner (Melville-Shreeve *et al.,* 2017, p. 10). Cotterill & Bracken (2020) highlighted the fact that SuDS are often used interchangeably with BGI, although there was little explanation for this (p. 2-3, Williams *et al.,* 2019, p.6). While the importance of investing in BGI and SuDS was briefly considered, there must be a greater consideration of the close links between these

solutions, to better understand their role in providing both a form of flood management, and amenity value (Melville-Shreeve *et al.,* 2017, p. 10, Dalton *et al.*, 2016).

2.5 Defining Greenspace, GI, BGI and SuDS

Considering the range of definitions relating to the practices discussed, there must be a clear set of definitions which can be applied and clearly understood throughout the research project. Table 3 below outlines how each term has been defined, based on the literature discussed above. Furthermore, Table 3 and Figure 5 outline the links between the practices, with examples of each technique provided.

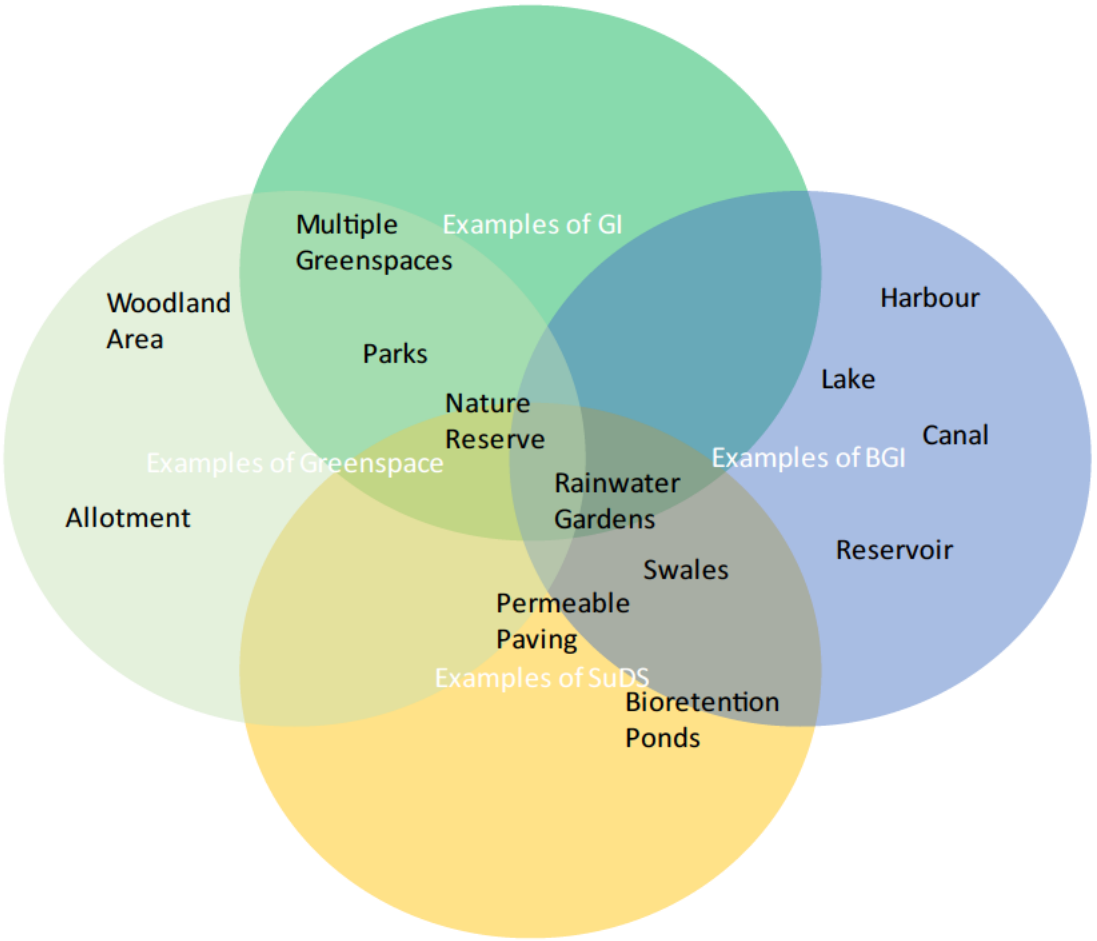
Table 3.
Definitions of Green Practices

Term	Definition (Formed by combining the interpretations provided in Chapter Two)	Examples include...
Greenspace	A vegetated area of land located in a rural or urban setting.	Parks, Nature Reserves, Woodland areas, Gardens, allotments
Green Infrastructure	A network of greenspace that benefits the surrounding population and natural environment.	Rainwater Gardens, green roofs, multiple greenspaces
Blue-Green Infrastructure	A network of greenspace that incorporates waterbodies and benefits the surrounding population and natural environment.	Swales, Lakes, Reservoirs, Canals, Waterfront parks, harbours
Sustainable Drainage Systems (SuDS)	A technique that can mimic the drainage of the natural environment, equally considering water quality, quantity, biodiversity, and amenity value.	Permeable Paving, bioretention ponds, tree planting,

Created by Author (2023)

Figure 5.

The Link Between GI, BGI, Greenspace and SuDS



Adapted from Stovin & Ashley (2019)

2.6 Greenspace and Wellbeing

The link between greenspace and enhanced physiological and mental wellbeing is commonly recognised throughout much of the literature, with research suggesting that interacting with outdoor spaces can reduce anxiety and the risk of cardiovascular diseases (Ambrey, 2016, p. 8). Greenspace can provide a feeling of calmness and relaxation to individuals, ensuring an opportunity to reflect and restore physical and mental wellbeing (Ackerman, 2018). Despite efforts to understand the role greenspace plays in improving wellbeing, it is evident that due to the subjective nature of the term, there is little understanding of why greenspace provides a benefit (Bell *et al.*, 2017, p. 94). While the most used definitions of greenspace and GI have reiterated a need to clearly define each term, there must also be a consideration of the functions of a greenspace which positively influence wellbeing. This subsection will consider how the literature defines "wellbeing", and the issues associated with its measurement.

An initial search was completed using SCOPUS to identify suitable publications that used the terms "greenspace" and "wellbeing" in the title, abstract or keywords. As research into the role of greenspace is still emerging, publications from all years were initially screened to consider their suitability. This allowed for the creation of a table which provides an overview of the elements associated with wellbeing. The key terms mentioned throughout the literature discussed can be seen in Table 4.

Table 4.

Wellbeing Definitions

Wellbeing is linked to…	Social and Recreational Value	Aesthetics	Quality of Life	Mental Health	Physical Health e.g., exercise	Psychological Restoration	Education	Environmental Benefit
Gladwell *et al.* (2013)					X			
Lee *et al.* (2015)	X			X	X	X	X	
Ambrey (2016)			X	X	X			
Lindgren & Elmqvist (2017)			X					X
Barton & Rogerson (2017)		X	X	X	X	X		
Zuniga-Teran & Gerlak (2019)				X		X		
Venkataramanan *et al.* (2019)	X							
Zhang *et al.* (2020)				X		X		
Grill *et al.* (2020)	X							
Scaria *et al.* (2020)				X		X		
Houlden *et al.* (2021)		X		X	X			
Huang *et al.* (2022)				X	X			X
Roberts *et al.* (2022)	X		X					
Bu *et al.* (2022)			X		X			

Note. 'Aesthetics" and 'Education' were included after the initial SCOPUS search, as multiple papers made reference to these elements.

Most of the literature fails to provide a clear definition of the term "wellbeing" but suggests that it is related to quality of life, typically involving an individual's mental or physical state (Zhang *et al.*, 2020, p. 1, Barton & Rogerson, 2017, p. 80). The elements associated with wellbeing commonly follow the headings above, however it was recognised that this list is not exhaustive. Lindgren & Elmqvist (2017) recognised the close link between mental and physical health and greenspace, suggesting that they provide "ecosystem services" which improve wellbeing. These services can be achieved by providing climate regulation (e.g., reducing the effects of the Urban Heat Island effect in urban areas), biodiversity conservation and improvements in air quality to name a few (Lin *et al.,* 2022, p. 2). Reduction of the UHI through using methods such as increasing vegetation cover not only reduces extreme temperatures, but also improves the liveability of urban areas (Marando *et al.,* 2022, p. 3). This not only reduces heat-related illnesses and mortality, but also relieves the discomfort associated with high temperatures (Marando *et al.,* 2022, p. 3).

These services provided by a greenspace can provide were closely associated with an improved mental and physical wellbeing, suggesting that interacting with the natural environment is fundamental in supporting human life (Lindgren & Elmqvist, 2017, Zhang *et al.,* 2020, p. 2). For example, one area which is being increasing discussed, is the link between improved air quality and the presence of greenspace (O'Regan & Nyhan, 2023, p. 2, Lei *et al.,* 2021, p. 2). As suggested by Lei *et al.* (2021), atmospheric particulate matter pollution (PM) continues to be an issue in terms of the health of those living in densely populated areas, with a recognition that urban greenspace provides an opportunity to improve local air quality (p. 1-2). It was suggested by Lei *et al.* (2021) that the presence of trees, shrubs and herbaceous vegetation can 'capture' chemical pollutants (e.g. ammonia and sulphur dioxide), and particulates (e.g., dust) in urban environments, reducing the health risks associated with poor air quality (Forest Research, 2024, Meo *et al.,* 2021, p. 1-3). With over half of the global population living in urban areas, greenspace can be key in providing clean air, which not only improves wellbeing, but also long-term physical health benefits for example, by reducing the risk of respiratory diseases (Public Health England, 2018, Meo *et al.,* 2021, p. 2). Lei *et al*. (2021) and Meo *et al.* (2021) have been clear in recognising the link between greenspace and improved air quality which not only highlights an additional benefit which can be provided, but it also reiterates the range of benefits a greenspace can deliver simultaneously in providing a healthy, and sustainable living environment, which is key in creating liveable, climate-resilient cities.

The role of ecosystem services and human health place an emphasis on the opportunities nature and/or access to a urban greenspace can have on wellbeing (Wong *et al.,* 2021, p. 166). Lindgren & Elmqvist (2017) considered the role of urban parks and gardens, suggesting that these spaces have a direct benefit on an individual's physical and mental health, promoting social cohesion, and an

improved quality of life. This was significant, with a clear view that greenspaces are essential to physical health, which can in-turn improve an individual's mental wellbeing in densely populated areas. This is a similar view to Huang *et al.* (2022), who suggested that urban greenspace can provide an escape from the home environment (p. 4). The paper considered wellbeing as an element that extends beyond an individual's physical and mental state, with greenspace allowing for ecological and economic gains (Huang *et al.,* 2022, p. 7, Lee *et al.,* 2015, p. 134). There was a recognition that vegetation is key to reducing high temperatures in urban areas, but also mention of the noise-reducing effects greenspace has (Lindgren & Elmqvist, 2017). This is important, with greenspace providing an opportunity to provide a 'buffer' to loud sounds and noises in an urban area, which could potentially reduce noise related illnesses e.g., hearing loss or sleep deprivation (Torres *et al.,* 2021, p. 6). While these benefits were only briefly mentioned, Huang *et al.* (2022) was clear in acknowledging the close link between improved wellbeing and the natural environment (Huang *et al.,* 2022, p. 2, Lindgren & Elmqvist 2017). It is clear that greenspace can provide multiple benefits that have a direct impact on an individual's quality of life and wellbeing (Wong *et al.,* 2021, p. 166). An increase in vegetation, and access to greenspace provides a benefit to both people e.g., by encouraging physical exercise and reducing the risk of noise and air pollution and the environment by planting vegetation that encourages ecological diversity (Torres *et al.,* 2021, p. 6).

2.7 Recreational Value and Wellbeing

One of the most detailed considerations of the role of wellbeing in urban greenspace has been made by Roberts *et al.* (2022), who considered the ability these spaces have in creating a multifunctional area (p. 6). In terms of wellbeing, while there was no explicit definition, it was considered that greenspace provides a unique opportunity for individuals to gain social and cultural connections, improving the quality of life of those using these spaces (Roberts *et al*., 2022, p. 2, Hancock & Mattick, 2019, p. 126). Roberts *et al*., (2022), was clear in acknowledging that greenspace contributes to the physical appearance of an urban area, providing both environmental and recreational opportunities (Roberts *et al.,* 2022, p. 5, Boyd *et al.,* 2018, p. 103). Interacting with a greenspace was considered key to improving an individual's mental wellbeing, Roberts *et al.,* (2022), failed to highlight how these social and cultural connections can be gained (p. 6). This is a common theme throughout the literature, highlighting the importance of understanding the functions in greenspace that influence this (Roberts *et al*., 2022, p. 5, Barton & Rogerson, 2017, p. 80). Grilli *et al.,* (2020) suggested that there are 'health-promoting functions' in greenspace which improve wellbeing, although once again, no reference was made to the specific features which provide this (p. 1).

2.8 Physical Wellbeing

One interaction with greenspace that has been considered in detail is the role of physical activity (Gladwell *et al.,* 2013, p. 1). Ambrey (2016) considered this, suggesting that those who exercise in urban greenspaces benefit more than those who exercise elsewhere e.g.,, at purpose-built gyms (p. 7). The paper considered the restorative effects of the natural environment, suggesting that interacting with a greenspace increases an individual's appreciation of the natural environment (Ambrey, 2016, p. 7). This increased appreciation can potentially encourage the use of these spaces, improving engagement with physical activity. While no definition of wellbeing was provided, the positive association between interacting with a greenspace and improved physical health was clear (Ambrey, 2016, p. 8, Gladwell *et al.,* 2013, p. 2). This was also one of only a few analysed papers (see table 4) to recognise the need for future research, considering the restorative benefits that exposure to nature can have for those living with dementia, although it was unclear where and how this should take place (Grilli *et al.*, 2020, p. 3, Ambrey, 2016, p. 9).

Barton & Rogerson (2017) explored the restorative benefits of greenspace, investigating the benefits that greenspace can have on socially marginalised and vulnerable groups e.g., elderly individuals. Throughout, physical activity was defined as 'green exercise' and was linked with enhanced mobility and a sense of belonging for those living with dementia (Barton & Rogerson, 2017, p. 80, Gladwell *et al.*, 2013, p. 2). Engagement with greenspace by engaging in meaningful activities e.g., horticultural programs is useful, as it may allow these individuals to feel empowered, and reinforce their identity, by engaging in activities (Mmako *et al.,* 2020, p. 3). This is interesting, as it highlights the ability greenspace has in enabling all who interact with a space to have a meaningful quality of life, which may not always be possible for those experiencing cognitive decline (Mmako *et al.,* 2020, p. 5). It was also suggested that physical activity can improve an individual's emotional state, reducing stress, apathy, and depression (Barton & Rogerson, 2017, p. 80, Gladwell *et al.,* 2013, p. 2). Both papers were significant in highlighting the opportunity that physical activity provides in improving both physical and mental health, although an in-depth study is necessary to identify the mechanisms in greenspace that encourage these interactions (Grilli *et al.*, 2020, p. 9, Barton & Rogerson, 2017, p. 81). Therefore, it is evident that the specific opportunities greenspace can provide must be explored in greater detail, with Barton & Rogerson (2017) clear in reiterating the need for an interdisciplinary approach (p. 81).

2.9 Mental Health

It has been suggested by Scaria *et al.,* (2020) that research regarding wellbeing and greenspace has remained in the medical field, due to a shift in attitudes towards mental health conditions (p. 3). While medical research can demonstrate the benefits of interacting with greenspace, there must be a greater

consideration of the characteristics in natural environments that may influence wellbeing (Bu *et al.,* 2022, p. 2, Nguyen *et al.,* 2021, p. 2). This is a similar view to Houlden *et al.* (2018) who considered wellbeing from a medical perspective, suggesting that in terms of greenspace, wellbeing is often only spoken about in relation to those suffering with a pre-existing illness (p. 3). Scaria *et al.* (2020) was significant in highlighting not only the need for an interdisciplinary approach, but also the necessity to investigate the role greenspace has on those without pre-existing conditions (Lee *et al.,* 2015, p. 132, Houlden *et al.*, 2018, p. 2). Exploring the role of greenspace in improving the health of those living with a pre-existing illness is important as it will not only encourage those living with conditions (e.g.,, Dementia and Alzheimer's) to engage with greenspace, but it also supports positive risk taking and provides a sense of power, by allowing individuals to explore places on their own (Mmako *et al.,* 2020, p. 7). This will not only allow for a greater understanding of the purpose of these spaces, but also provide recommendations to encourage individuals to interact with it (Coutts & Hahn, 2015, p. 9770). In understanding this, there is a clear opportunity to explore the role that greenspace has in improving wellbeing from a social science perspective, which could be broken down further e.g., comparing the views of geographers, psychologists and sociologists (Lee *et al.*, 2015, p. 132, Henderson *et al.*, 2013, p. 777). This approach would not only allow for a greater understanding of the role of wellbeing, but also a consideration of the social and environmental factors which influence health (Economou *et al.*, 2020, p. 36, Barton & Rogerson, 2017, p. 80, Lee *et al.*, 2015, p. 132).

2. 10 Quantifying Wellbeing

Alongside the ambiguity associated with defining "wellbeing", measuring the benefit an individual receives from a space appears difficult (Zuniga-Teran & Gerlak, 2019, p. 22). While it has been suggested that greenspace 'enhances' wellbeing in urban areas, by improving cognitive function and mental health, it is unclear how this is provided, and whether every individual receives an equal benefit (Lambert *et al.,* 2019). Zuniga-Teran & Gerlak (2019) was clear in highlighting the lack of cohesion between studies relating to greenspace and green infrastructure, suggesting that this has led to further confusion in understanding wellbeing and its function (Sandifer *et al.*, 2015, p. 2). It was recognised that a collaborative approach is crucial to understanding the role of wellbeing, although it was unclear how this could be achieved (Zuniga-Teran & Gerlak, 2019, p. 2). Despite clearly outlining the link between greenspace/GI and improved wellbeing, there was a failure to recognise how wellbeing can be quantified, reiterating the subjective nature of the term (Roberts *et al.*, 2022, p. 7, Almeter *et al.,* 2018, p. 2). The uncertainty in measuring wellbeing suggests that instead, a set of criteria should be made, which encompasses the different elements (e.g., physical, mental, economic aspects) to be considered a part of wellbeing (Boyd *et al.,* 2018, p. 111). This could not only provide a basis for future

studies but create a more informed understanding of the link to green stormwater solutions and across the disciplines (Zuniga-Teran & Gerlak, 2019, p. 2).

The challenges surrounding measuring wellbeing have been considered by Krueger & Stone (2014), who outlined potential methods which could be used (p. 1). Wellbeing was defined as 'an individual's lived experience and the activities they undertake', linked to the recreational opportunities this element can provide (Krueger & Stone, 2014, p. 3, Benjamin *et al.,* 2014, p. 40). Krueger and Stone (2014) suggested using response scales e.g., a Likert Scale ('extremely satisfied' to 'not at all satisfied' the lowest), to 'rate' wellbeing, similar to Table 5. While a Likert Scale allows participants to provide a quantifiable answer, it was recognised that it is difficult to validate a scale where participants are unlikely to have the same shared experiences (Krueger & Stone, 2014, p. 2, Diener, 2013). Despite clearly outlining the challenges associated with measuring wellbeing, there must be a greater acknowledgement of the importance of developing a framework to interpret findings (Houlden *et al.*, 2018, p. 2, Krueger & Stone, 2014, p. 2).

Table 5.

Example of a Likert Scale

	Extremely Satisfied	Somewhat Satisfied	Not at all Satisfied	Neither Agree nor Disagree
Statement 1				
Statement 2				
Statement 3				

Adapted from Kreuger & Stone (2014)

An alternate approach has been considered by Nieuwenhuijsen (2022), who also recognised the difficulty in measuring wellbeing (p. 2). It was suggested that while the natural environment can improve an individual's wellbeing and quality of life, it is unclear how much greenspace exposure is needed to benefit health (Nieuwenhuijsen, 2022, p. 2, Coutts & Hahn, 2015, p. 9788). Nieuwenhuijsen (2022) considered the 3-30-300 rule of thumb, which requires that every citizen can see at least three trees from their home, have 30% tree canopy cover in their neighbourhood and not live more than 300 meters away from greenspace (Nieuwenhuijsen, 2022, p. 3, Almeter *et al.,* 2018, p. 2). While a method of measuring greenspace exposure was suggested by Nieuwenhuijsen, (2022), they failed to link this back to wellbeing, providing no definition of the term, despite previously mentioning the relationship between the two elements (Diener, 2013). This highlights a clear need to consider the role of wellbeing in greater depth to ensure it is equally regarded throughout the literature (Zuniga-Teran & Gerlak, 2019, p. 18).

2.11 Conclusion

A review of the existing literature relating to greenspace and wellbeing has reiterated the necessity in exploring how the public define both terms, to examine whether this influences a spaces purpose, or benefit (Ministry of Housing, Communities and Local Government, 2021, p. 12). Most of the literature relating to greenspace, GI and SuDS has highlighted the ability these techniques have in creating a multifunctional area, which can benefit both the natural environment and communities (Mell, 2017, p. 137, Barton & Rogerson, 2017, p. 80). Despite this, it has been recognised that due to multiple disciplines involved in studying and implementing greenspace and GI, interpretations of the term vary (Taylor & Hochuli, 2017, p. 26). Section 2.2 has emphasised that there must be a set or criteria that can be applied across all disciplines, to ensure that these approaches are implemented effectively, by using a clear set of descriptors that is used by all involved (Taylor & Hochuli, 2017, p. 26). In creating a criteria, it will allow for a greater investigation into the role of greenspace, by examining how individuals utilise a space (Hubert *et al.,* 2012, p.2). This will not only allow for a thorough investigation of the impacts these spaces have on mental and physical wellbeing, but also potentially help encourage individuals to engage with these areas, if they are more aware of the benefits a greenspace can provide (Barton & Rogerson, 2017, p. 79).

Alongside the consideration of GI, BGI and SuDS, it is clear that there is also confusion surrounding defining "wellbeing", which makes it difficult to examine the extent of the role greenspace can play in improving this. Throughout the literature, wellbeing is referred to as an individual's physical or mental state, with much of the research referencing the opportunity greenspace can provide in enhancing quality of life, providing a space for individuals to relax and restore (Krueger & Stone, 2014). However, it is evident throughout, that providing a singular definition of the term appears difficult, due to its subjective nature (Nieuwenhuijsen, 2021, p. 318). While physical and mental health are often spoken about together, much of the literature does not consider the full scope of elements considered as wellbeing, with some failing to mention the recreational opportunities than can be gained (Zuniga-Teran & Gerlak, 2019, p. 18). The failure to outline the number of elements associated with wellbeing e.g., physical, mental, economic etc. highlights a clear gap in the literature, with a need to create a set of criteria which sets out each element considered as part the term. These criteria will allow for a clear outline of the different elements considered as part of wellbeing, providing a basis for future research (Boyd *et al.,* 2018, p. 111). In achieving this, it will allow for a greater understanding of the most appropriate methods of quantifying wellbeing, with much of the literature suggesting that it is relatively unclear how much greenspace is necessary to benefit health (Nieuwenhuijsen, 2022, p.3). GI, in the form of SuDS or NbS are going to become a necessity in our future cities, therefore understanding their wider benefits will speed up the process.

With these considerations in mind, the literature discussed throughout Chapter Two has shaped the intended outcomes and methodology of the project, informing the research aim and objectives. These are outlined in Table 6.

Table 6.

Project Aim and Objectives

Project Aim:	To investigate how greenspace in Leeds influences wellbeing.
Objective One:	To assess how individuals define greenspace.
Objective Two:	To investigate if an individual's understanding of greenspace influences how it is used.
Objective Three:	To identify the benefits that greenspace can provide.

It is evident that there must be a greater examination surrounding the role of greenspace in urban areas, to consider how the availability and accessibility of a space influences the benefits it can provide, as outlined in the project aim (Barton & Rogerson, 2017, p. 80). As mentioned, it appears difficult to examine the role of greenspace without firstly investigating how individuals define the term, therefore this must be understood, and is the first objective of the project. In achieving objective one, it will allow the second objective to be explored, through considering how an individuals interpretation of greenspace influences its purpose and their attitudes towards the natural environment. Objective Two will inform the third intended outcome of the project by allowing for an investigation into the benefits that individuals associate with interacting with greenspace. Objective three will allow for a consideration of mental and physical wellbeing, and the role greenspace can play in improving an individuals health (Mell, 2017, p. 137).

3.0 Methodology

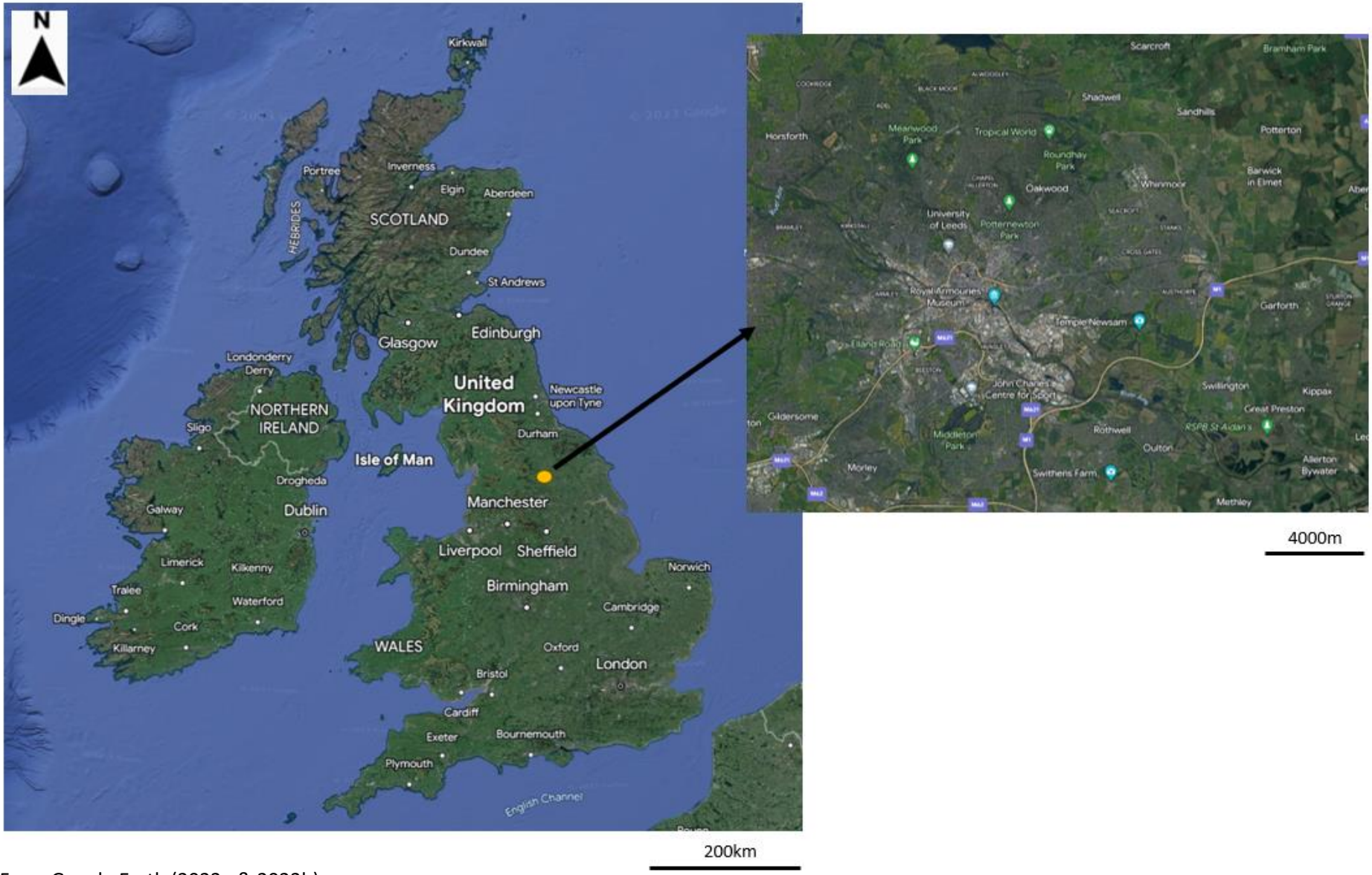
3.1 Introduction

As considered throughout the literature review (see chapter two), there are multiple definitions relating to greenspace, GI, BGI and SuDS (Barton & Rogerson, 2017, p. 80). With the use of greenspace encouraged by the UK Government and local councils, it is evident that there must be a greater investigation into how individuals define "greenspace", and whether sustainable practices such as SuDS can provide a health and wellbeing benefit (Cotterill & Bracken, 2020, p. 4-5). As discussed in Chapter 1, spending time and living in an urban area can increase the likelihood of experiencing poor mental health, therefore there must be an investigation into the role of urban greenspace, and the potential opportunities it provides in promoting an increased mental health and wellbeing (Cohen-Cline *et al.,* 2015, p. 525).

While multiple cities and towns were considered to be relevant to the study, it become apparent when undertaking the literature review that a lot of the existing research placed a greater emphasis on the role greenspace has in large cities in the West Midlands e.g., Birmingham and in the South East in London (Leeds City Council, 2021). A lack of consideration for medium to large cities is therefore necessary for areas in the North East and West of England, as greenspace in these areas is able to provide an equal amount of benefits to those elsewhere (Office for National Statistics 2021d). With this in mind, Leeds was chosen as the study site, to consider the role of urban greenspace in providing a benefit to wellbeing (section 3.2). A site overview is outlined in Figure 6.

Figure 6.

Location of Leeds



From Google Earth (2023a & 2023b)

In Leeds, it is estimated than 45 million adults visit urban parks per year, with greenspace reflecting the culture of local communities, providing a social value, while also encouraging wildlife diversity and accessible public outdoor spaces (Leeds City Council, 2022). As mentioned in the Leeds Parks and Green Spaces Strategy, it is estimated that utilising parks saves health and wellbeing services an average of £21 per visit, while also supporting healthy and active lifestyles (Leeds City Council, 2022). With this in mind, this project draws upon similar studies to assess the links between utilising greenspace, GI, BGI and SuDS and the influence this may have on wellbeing and health. The following chapter addresses how the most appropriate methods of data collection were identified and evaluated.

3.2 Study Sites

A focus throughout the literature is often placed on larger cities across England, with an emphasis on greenspace projects in areas in the South East and Midlands (Jabbar *et al.,* 2021, p.4406). While increasing the awareness of why greenspace can be beneficial in any sized city is vital in encouraging uptake, it is important to consider the role of medium to large-sized cities across the England equally (Office for National Statistics 2021c). Achieving this not only allows for an examination of the influence greenspace has in these areas, but highlights if interacting with outdoor space provides the same benefits (Jabbar *et al.*, 2021, p. 4408). For that reason, the project considered the role of greenspace in a medium to large-sized city, with Leeds chosen as the study area. The selection of Leeds was further seen as appropriate when considering the sites location, which is surrounded by national parks, just 39 miles away from the Yorkshire Dales and 53 miles from the Peak District. The importance of having accessible greenspace in the city centre is not always considered, with an assumption that individuals will travel to parks and areas outside the city instead (Leeds City Council, 2021). Despite this, urban greenspace is crucial in the city centre, with poor public transport and the cost of visiting greenspace outside of urban areas not accessible for all (De Luca *et al.*, 2021, p. 11054). Not only does this restrict who can visit rural greenspace, but reiterates the importance of having accessible urban areas, to ensure greenspace is available for all.

Leeds City Council have produced the “Parks and Green Spaces Strategy” outlined in Appendix A, with a vision to improve the management and accessibility of greenspaces across Leeds between 2022-2032 (Leeds City Council, 2022). The strategy is being undertaken by Leeds City Council’s Parks and Countryside Service, who oversee the management of 4,000 hectares of greenspace across the region (Leeds City Council, 2022) The strategy is significant in highlighting the link between interacting with greenspace and health benefits, with Leeds parks contributing £598 million per year to improving mental and physical wellbeing and quality of life (Leeds City Council, 2022). While the specific health

benefits associated with greenspace are not provided in the strategy, it is recognised that encouraging physical exercise in greenspace can create a multifunctionality to these areas, providing a benefit to public health and the natural environment. Increasing the funding and maintenance of these spaces can also result in increased biodiversity, mitigating the impact of climatic change in the area (Leeds City Council, 2022). With the aim of delivering high quality greenspace, the strategy uses the international Green Flag standard, which is the benchmark standard for creating publicly accessible parks and greenspace (Green Flag Award, 2023). The Leeds Quality Park (LQP) values are also used to assess urban parks, by considering how welcoming a space is, its level of maintenance and its level of safety and security (Leeds City Council, 2022). The LQP values can be seen in Appendix B.

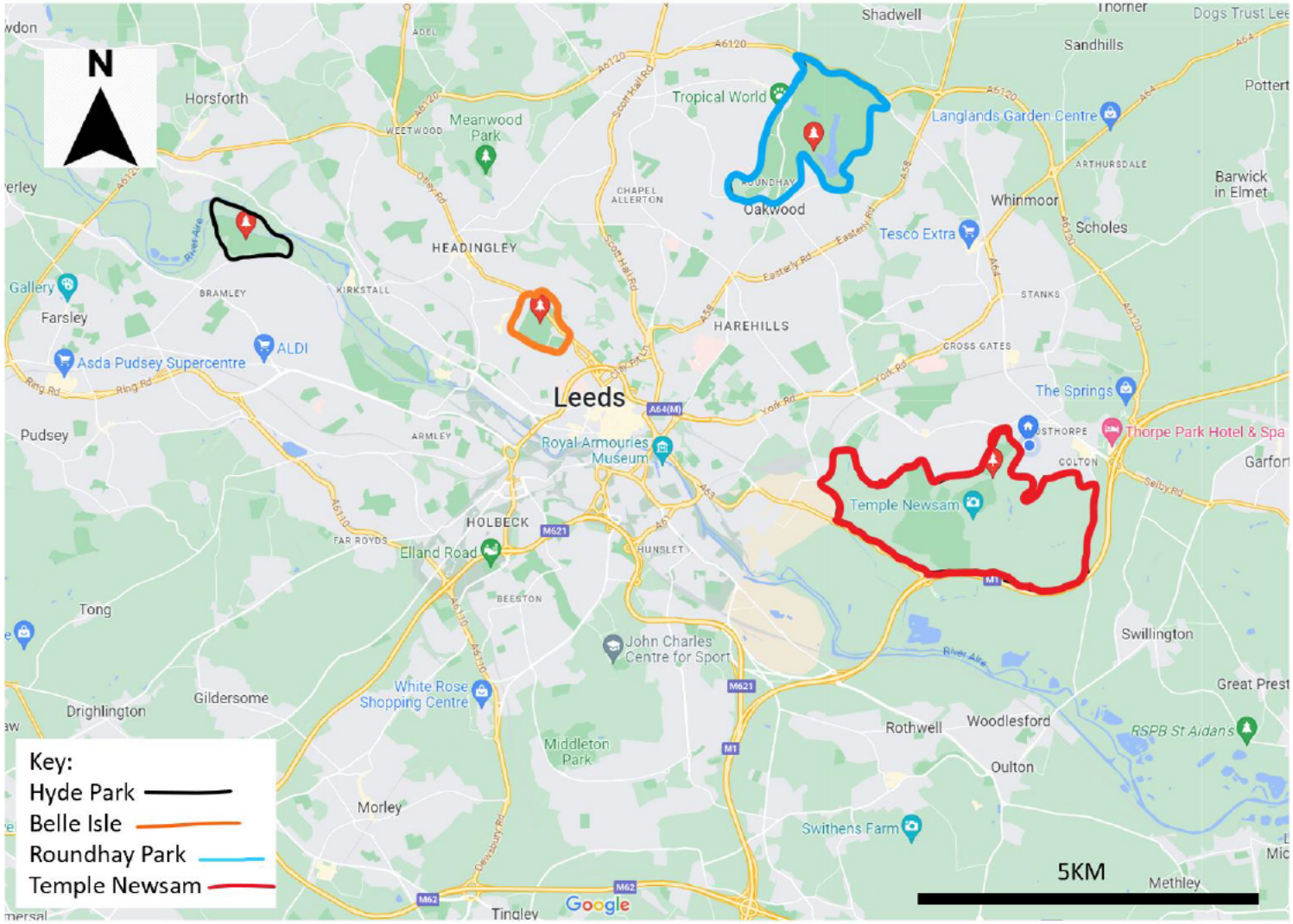
With the Parks and Green Spaces Strategy in mind, it is important to investigate whether individuals in Leeds find the urban greenspace available to be beneficial to their physical and mental health and wellbeing (Leeds City Council, 2017). The strategy has aided the decision to place a focus on Leeds, as the city has implemented a clear approach to ensure that greenspace is accessible and available for all (Cohen-Cline *et al.,* 2015, p. 4). Leeds City Council continue to recognise the importance of creating a sustainable city that equally benefits individuals and the environment, therefore investigating whether communities believe this to be the case is key (Leeds City Council, 2021).

3.2.1 Site Selection Process

As the study was based in Leeds, there was already a more in-depth knowledge of the city and the greenspaces across the region, which has informed the study site selection process. At the beginning, a range of sites were screened for their suitability, considering the list mentioned in the Parks and Green Spaces Strategy (Appendix B), which highlights the most popular areas of greenspace across Leeds (Leeds City Council, 2022). By choosing popular areas of greenspace, it also improved the likelihood of a higher participant rate for interviews, as it was more likely that a greater number of participants used the sites most frequently mentioned throughout the strategy. Initially four provisional sites were chosen (Figure 7), however, all participants chose to be interviewed at only two of the four sites suggested, due to their location relative to the participants home address, therefore Hyde Park and Bell Isle were not used as part of the interview process. Despite only two of the sites being used to hold interviews, there was a higher result of participants who wanted to take part at Temple Newsam and Roundhay Park, resulting in a higher engagement than initially expected. This also allowed for a greater focus of the two sites.

Figure 7.

Location of Study Sites



From Google Earth (2023c)

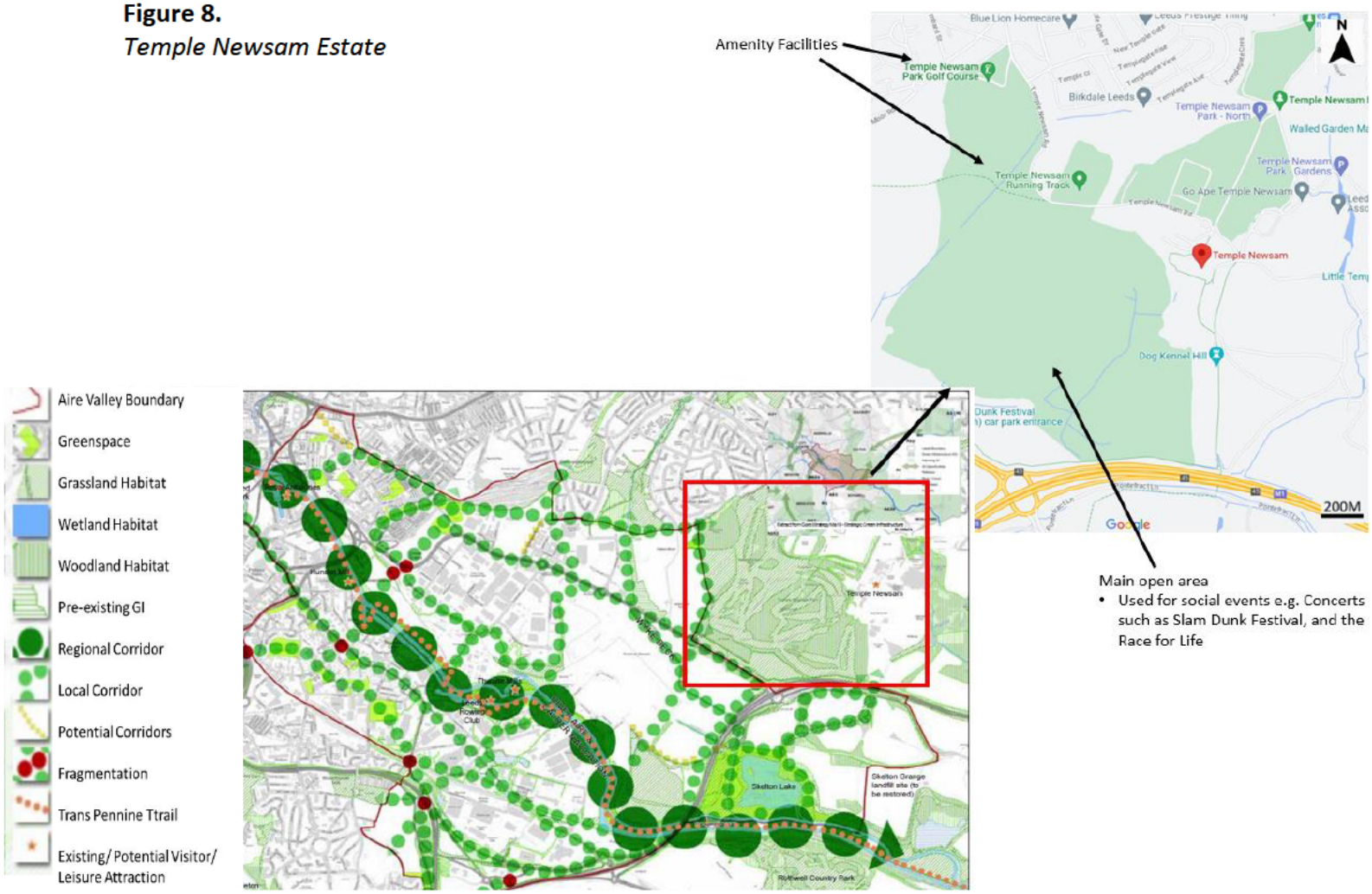
All sites chosen were urban parks, located no more than 20 minutes from Leeds Train Station by public transport. It was recognised that urban greenspace would be more accessible for participants to reach, as there are both public and private transport links as well as public footpaths, encouraging a higher number of participants to take part in the study. It was important to pick two similar greenspaces to ensure that the data collected at both was comparable, allowing for an investigation into the use of urban parks by residents, and the potential benefits urban greenspace can provide (Barker *et al.*, 2019a, p. 496). Moreover, as mentioned by Barker *et al.* (2019b), British urban parks are crucial in promoting social and cultural opportunities for individuals (p. 2457).

While the study focuses on Leeds, it is recognised that the outcomes of the project can be applied to other similar sized cities and towns. As there have been few studies into the role of greenspace in medium to large-sized cities, which have between 100,000 and 750,000 inhabitants, with Leeds on the verge of being a "large-sized 'core' city" (ONS, 2021). By focusing on one and exploring how individuals interact and utilise these areas, the results and recommendations found as a result of the project can be replicated in other similar sized areas. This study instead provides a baseline for future research to expand on, by investigating the role and understanding of greenspace in a medium-sized city, to consider the influence this has on wellbeing.

3.2.2 Temple Newsam

Temple Newsam is an urban park located in east Leeds. The land was designated to building Temple Newsam House in 1086, after the land was bought by the British Monarchy (Leeds City Council, 2023). Temple Newsam was owned by the British Monarchy until the 1900s, when Leeds City Council purchased the land, and opened the estate and surrounding area to the public (Leeds City Council, 2023). An overview of Temple Newsam estate and the surrounding parkland is given below in Figure 8, pictures of the sites are located in Appendix C.

Figure 8.
Temple Newsam Estate



From Google Earth (2023d) & Leeds City Council (2021)

The house is a Grade I listed building, with the grounds of the estate also receiving a Grade 2 status on the Register of Historic Parks and Garden of Special Historic Interest in England (Friends of Temple Newsam 2023). The surrounding land contains facilities such as a golf course, and a playground which is accessible to both disabled and able-bodied children. Alongside this, the site has a farm and estate gardens which are open to the public. The woodland areas across the park are part of the Forest of Leeds, which consists of patches of greenspace located across the city centre, with the entire forest an estimated 1200 hectares in total (Leeds City Council, 2023).

Also shown in Figure 8 is Temple Newsam's location in relation to Leeds' GI network, which was created as part of the Aire Valley Leeds Area Action Plan published in 2017, which encouraged greenspace across Leeds city centre to be connected, to ensure communities have access (Leeds City Council, 2021). It is important to consider that within the Aire Valley (Figure 7), Temple Newsam is the largest greenspace present in the area, located in the middle of multiple small communities e.g., Colton and Whitkirk. On a wider-scale, the GI policy in Leeds predominantly focuses on achieving sustainable development, by protecting existing greenspace and ensuring that each objective of the NPPF are met (Leeds City Council, 2021).

3.2.3 Roundhay Park

Roundhay Park is an urban park located in north Leeds. Initially the area was used for hunting in the thirteenth century, with the estate purchased by Leeds City Council in 1872 and later opened as a public park (Roundhay Park, 2022). The site has over 700 acres of open space and woodland and is considered one of the largest urban parks in Europe (Roundhay Park, 2022). Alongside this, there are two lakes on the site, with the Upper Lake advertised as a 'wildlife area' and Waterloo Lake used for fishing (Leeds City Council, 2023). Similar to Temple Newsam, Roundhay Park is considered part of the Forest of Leeds (Leeds City Council, 2023).

Roundhay Park is part of a SuDS and surface water separation scheme to reduce the frequency spills from the residential combined sewer overflow located 500m away (Roundhay Park Lane CSO). A number of solutions have been implemented, developing a rain garden and increasing vegetation cover in residential areas (Lockhart & Brier, 2022). A bioretention system has also been developed utilising reclaimed cobblestones to slow down surface run-off, as evident in Figure 9 (Ashley *et al.,* 2018, p. 58).

Figure 9.

Bioretention Areas next to Grass Verges

From Lockhart & Brier (2022)

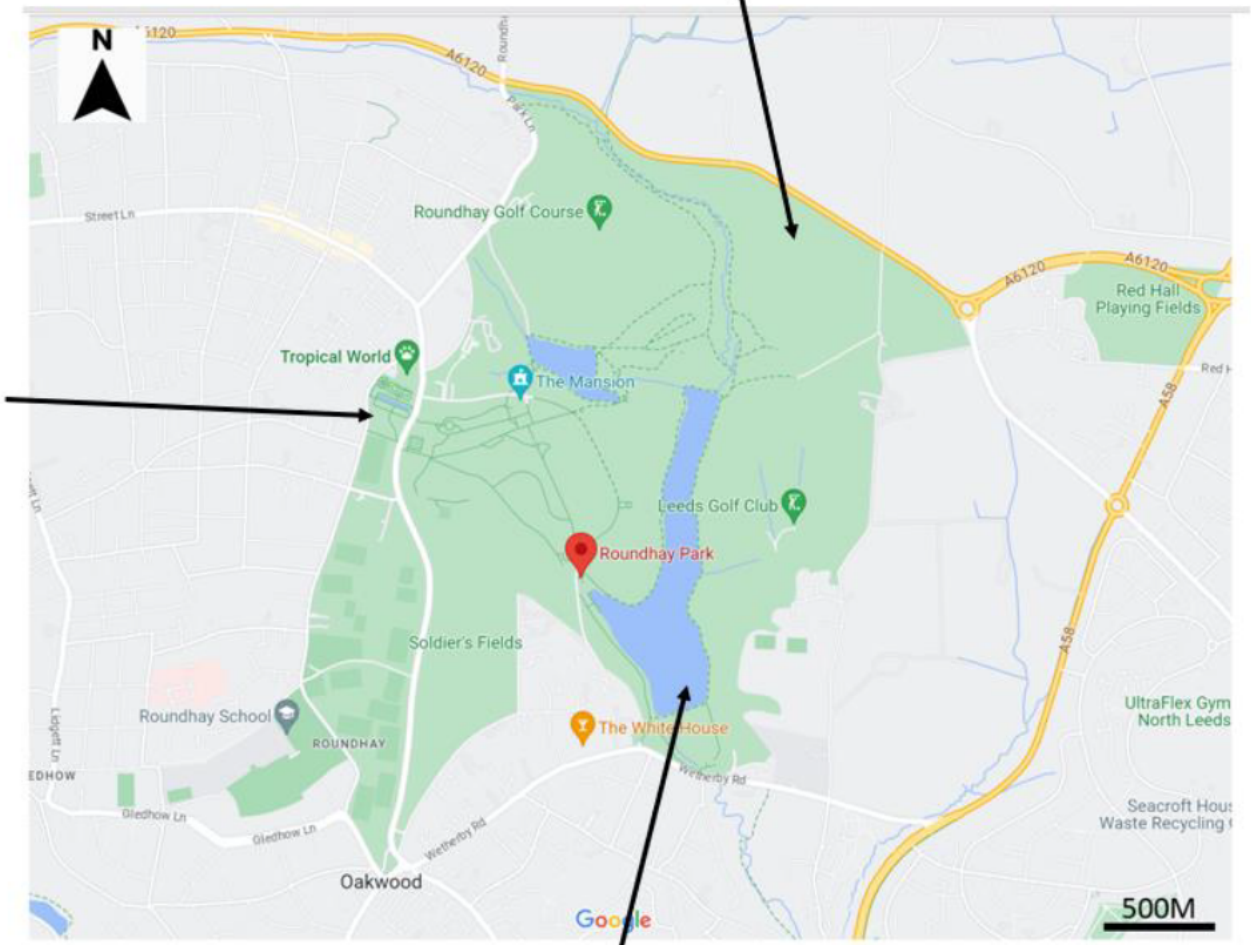
Throughout the scheme, the importance of implementing SuDS was reiterated throughout, with the project considered to be located in a "sensitive urban environment", that must consider how the existing design of the area could be adapted to reduce the potential disruption during construction and the operation of the chosen methods (Lockhart & Brier, 2022). This led to multiple areas being

retrofitted with SuDS devices, e.g., through placing new road gullies and new pipework within existing grass verges and driveways (Ashley *et al.,* 2018, p. 58). While the main objective of the project was to improve water quality and quantity, there has also been a benefit to amenity value, by enhancing the visual appearance of residential roads (Lockhart & Brier, 2022). Roundhay Park and the surrounding area is given below in Figure 10.

Figure 10.
Roundhay Park Estate

Main open area
- Used for social events such as the North Leeds Food Festival

Recreational area
- Location of tennis and badminton courts that are free to use



From Google Earth (2023e)

Roundhay Park Main Lake
- There are multiple trails located round the area e.g. a forest trail, paved trail and water activities

3.3 Research Design

Before any data could be collected, the existing literature was analysed to consider the most appropriate methods of data collection when examining mental and physical wellbeing, health, and SuDS. As research into the link between greenspace and mental and physical wellbeing is still relatively new, publications from all years were initially screened to consider their suitability.

A mixed-method approach that incorporated both qualitative and quantitative methods of primary data collection was most appropriate, as the aim of the project was to investigate how greenspace in Leeds influenced wellbeing and understand how greenspace is defined (Flowerdew and Martin, 2013, p.149). The mixed-method approach has shaped the philosophical standpoint throughout the project, adopting an interpretivist approach, as it was recognised that participants will attach different meanings and interpretations to greenspace and wellbeing, depending on how they utilise a space, and whether they find it to be beneficial (Rogers, 2020). An interpretivist approach recognises the importance of context, that an individual's beliefs and attitudes are essential in interpreting and investigating the role of greenspace (Putnam & Banghart, 2017, p.3). The philosophical standpoint of the project is further supported by using grounded theory, which ensured a controlled direction of the study, by reiterating the importance of research context (Hassan, 2022). This is reflected through the coding and categorising of themes in both questionnaire and interview responses. Once the research approach had been decided upon, areas of greenspace were chosen, as outlined in subsection 3.2.

A greater emphasis was placed on descriptive methods of data collection, as this type of research would allow for a greater understanding of how greenspace is utilised, and consider the relationship between people and nature (Paradis *et al.,* 2016, p. 263-264). It was also recognised that it is difficult to quantify attitudes and opinions, with statistical analysis only used on questionnaire responses where numerical data was involved e.g.,, gender and age responses, or a scale to measure responses (Communities Living Sustainably & Growing Health, 2016).

Multiple papers suggested that an online questionnaire was an appropriate technique to gain an initial understanding of how individuals define greenspace and how they utilise these areas (Creswell *et al.,* 2018). While an in-person questionnaire would potentially allow for a more relaxed conversation with individuals, it was recognised that an online questionnaire would be more likely to reach a larger audience, as it can be shared across social media, allowing for a greater geographical coverage (Phellas *et al.,* 2011). As the questionnaire was not targeting a specific audience, it was most appropriate to use an online format, as it increased the likelihood of a higher response rate and improved the geographical reach, as it could be published online (Kindon *et al.*, 2008).

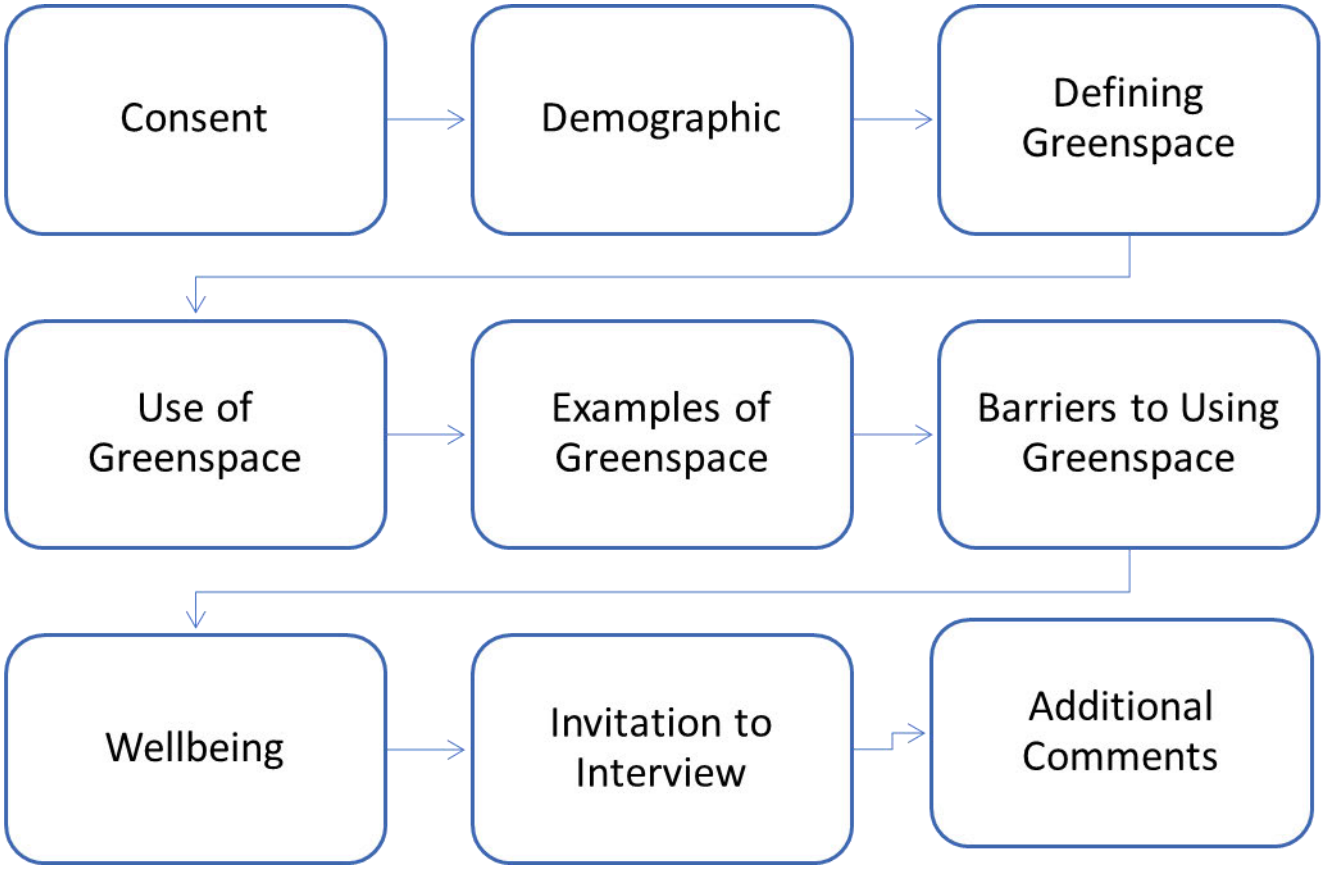
Semi-structured interviews were also considered appropriate, as they could expand on the questions asked in the questionnaire, allowing for a more in-depth understanding of the role of wellbeing and how greenspace may influence this (Saunders, Lewis, & Thornhill 2009). With the personal nature of wellbeing, it was also recognised that a semi-structured interview would ensure that questions could be tailored to each participant (Magaldi & Berler, 2020, p. 4825).

Through placing an emphasis on qualitative methods of data collection, it was important to be aware of positionality and reflexivity, and the potential influence this can have on decision making when conducting research (Shepherd *et al.,* 2022). It was recognised that positionality can change throughout a project, therefore it was important to dedicate time to reflect on the project progress, make a note of any concerns or issues and address these immediately with the supervisory team. By being aware of how the researchers perspective can influence each aspect of the research e.g., when conducting data collection or analysing results, it ensured that there was an awareness throughout of how to understand and avoid an unintentional bias that may negatively impact the project (Shepherd *et al.,* 2022). With this in mind, at each stage of the research (e.g., prior to starting research, during the data collection process and analysis of results), the researchers positionality was identified, with weekly reflections undertaken to consider notable results and ideas (Holmes, 2020, p. 3). By reflecting on research progress, it not only enhanced the integrity of the study, but also benefitted the analysis and interpretation of the research findings, by acknowledging the role the researcher can have, reducing the risk of bias (Stenson & Kepler, 2019, p. 254).

3.4 Questionnaire Design

Online questionnaires were distributed using Jisc Online Surveys to gain an understanding of how individuals define greenspace, and consider how often these areas are used, with the structure of the questionnaire outlined in Figure 11 and Appendix D. After giving consent, participants were asked to provide their age and gender to gauge an understanding of who was participating in the survey and consider if this influenced the results. Alongside this, participants were asked to define greenspace, note the amount of time they spend in these areas, and comment on three examples of urban greenspaces across England, to consider whether they perceived these areas to be classified as greenspace and their reasoning behind this.

Figure 11.
Questionnaire Outline



Data was collected between 6th February 2023-14th April 2023 to allow participants enough time to respond, while ensuring there was an appropriate timeframe after to analyse the responses (Peters, 2017). A target response rate of 100 was chosen, as it was acknowledged that a low response rate would recue the validity of the data collected (Vasileiou *et al.,* 2018, p. 20). It was recognised that if and when this was reached, the survey would remain open to ensure that as many responses as possible were recorded to increase the reliability of the findings (Peters, 2017). To ensure a high response rate, the survey was promoted every few weeks on social media platforms including Facebook, LinkedIn, Twitter and surveycircle, a research led website used to promote academic surveys. While using social media excludes those who do not have an online presence, it was recognised that posting the survey online would increase the likelihood of reaching a larger audience, as the questionnaire could be reposted and shared by those who have completed it (Pulido *et al.,* 2018, p. 2). Convenience sampling was the most appropriate method of collecting responses, as the aim was to gain a general understanding of a section of the population's awareness of greenspace, GI, BGI and SuDS, as opposed to focusing on one specific demographic (Andrade, 2020, p. 86). This method was time-efficient as the questionnaire could be provided to anyone who was available to answer (Emerson, 2021, p. 76).

All individuals over the age of 18 were invited to respond to the survey, with all respondents providing their information anonymously, to allow for honest feedback, increasing the likelihood of a higher response rate as respondents could not be identified (Etikan *et al.,* 2016). Once the questionnaire had closed, 217 individuals had started the survey, with 139 fully completed responses received in total, achieving the target response rate. The demographics of the participants who took part is outlined in Table 7.

Table 7.

Demographic Data from Survey

Gender	Age				Totals
	18-34	35-49	50-64	65+	
Female	53	24	12	4	93
Male	15	16	8	1	40
Non-Binary	3	1	0	0	4
Other	0	0	0	0	0
Prefer Not to Say	1	1	0	0	2
Totals	72	42	20	5	139

After a month of having the questionnaire open, it was recognised that the majority of participants were between the 18-34 age bracket, therefore using purposive sampling, by posting on LinkedIn, Facebook and to people in-person allowed the questionnaire to be targeted to those over 34, to increase the response rate for this demographic (Pulido *et al.,* 2018, p. 2). The age groups used in the online questionnaire were chosen as they are most commonly used in qualitative research, and were recommended by both Flowerdew and Martin (2013), and Smith (2018).

3.4.1 Questionnaire Analysis

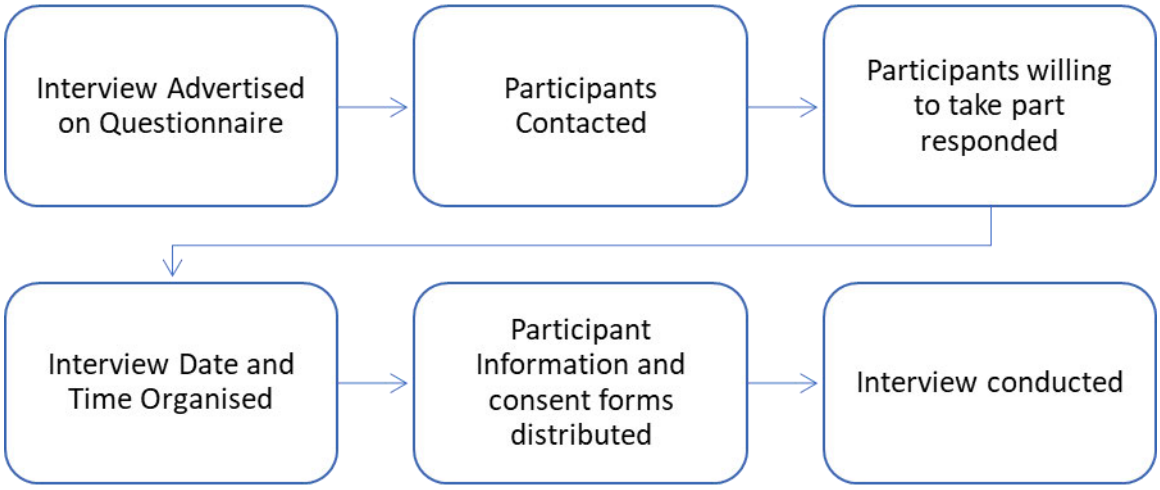
Responses were analysed using a combination of qualitative and quantitative methods. Initially a content analysis was undertaken, as this allowed for common patterns to be identified and grouped together based on their similarities. This form of analysis was the most appropriate method of beginning to interpret responses, as it allowed for a better understanding of what the respondents considered to be greenspace, and how this has informed their relationship and use of the outdoor environment (Erlingsson & Brysiewicz, 2017, p.95).

Ideally, there would have been a statistical analysis and comparison of the results collected from the online questionnaire, for example,. the attitudes individuals had to the two sites shown in the questionnaire, however due to the subjective nature of responses, it was difficult to associate a numerical value to the responses. A Chi-Square analysis to investigate the role of multiple variables such as age, gender, and attitudes was attempted, however due to there being more than two variables, and attitudes being difficult to quantify, it was decided that attempting to place a value on these variables was not appropriate. A thematic analysis was most appropriate for these results, with the qualitative comments collected were also analysed alongside the themes picked out in from the interview transcripts (subsection 3.6). The main categories picked were based on the most frequent responses. The categories were: How is greenspace defined, the purpose of a greenspace, and feelings of wellbeing that the individual received.

3.5. Interview Design

Interviews were advertised at the end of the online questionnaire, with all participants invited to take part in an in-person interview at either Temple Newsam or Roundhay Park. The process undertaken to arrange and conduct each interview is outlined in Figure 12. Interviews were conducted on a first-come, first-served basis, with a snowballing technique used, as the number of participants was reliant on ensuring that they answered the questionnaire and were willing to participate.

Figure 12.
Interview Process



As the interviews were reliant on participants living near an urban greenspace, it was ensured that the areas picked were within public access. Multiple dates at both Temple Newsam and Roundhay Park were provided, to increase the likelihood of a higher response rate. It was also recognised that the number of participants was reliant on individuals' availability, therefore it was expected that not everyone who expressed an interest in taking part in an interview would be available for the provided dates.

Prior to the interview, participants were assured that responses would remain anonymous, as this allowed for honest feedback, while also ensuring that responses could not be identifiable (Dougherty, 2021, p. 485). A sample group of 5 was initially chosen, as it was recognised that it would be difficult to recruit participants, due to many not feeling comfortable discussing their personal wellbeing. Individuals who lived in Leeds and expressed an interest in the questionnaire were interviewed, however it was recognised that data collection would not be restricted if more than 5 individuals wanted to take part, as this would increase the validity of the interview findings (Saunders *et al.*, 2015, p.618). While this cannot be considered fully representative of every greenspace across the UK, by interviewing those who interact with these areas, it provided an initial understanding of each participant's understanding of greenspace, while beginning to investigate the role of wellbeing.

Participants were allowed to choose whether they wanted to complete an interview online, or in-person to ensure that they felt relaxed when answering questions, and further increase the likelihood of participation (Dougherty, 2021, p. 487). Participants were also offered the freedom to choose whether they wanted to complete the interview on their own or in a group, as it is recognised that with the personal nature of wellbeing, individuals may feel more comfortable discussing the topic around others. Whilst it is understood that conducting all interviews in the same format would be preferable, it was acknowledged that the participants welfare and preferences were more important, to ensure that individuals felt comfortable throughout. Nine interviews took place, focusing on the individuals understanding and use of greenspace, awareness of sustainable practices such as SuDS, their definition of wellbeing, and if they felt that greenspace had an influence on their health. An overview of the questions asked throughout the interview can be found in Appendix E.

Prior to the interview commencing, the participant was shown a map of the site (Figure 13a and 13b) which outlined the route that would be taken while the interview took place. This also allowed for participants to note any additional areas that they used across the site, and ensured they were comfortable with the chosen route. A Dictaphone was used to record responses.

Figure 13a.

Route Taken at Temple Newsam

From Google Earth (2023f)

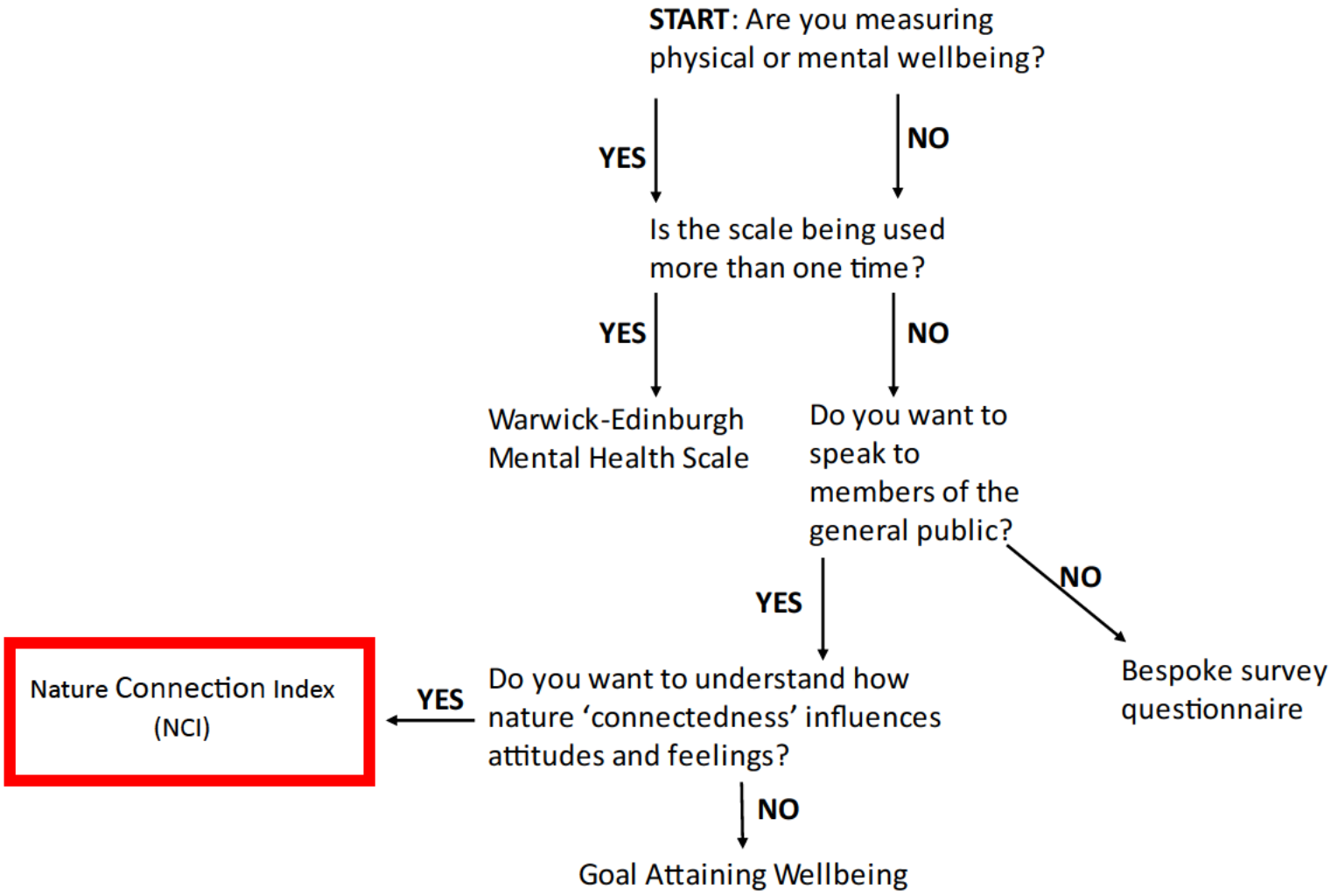
Figure 13b.

Route Taken at Roundhay Park

From Google Earth (2023g)

In consideration of wellbeing, it was acknowledged that quantifying it was difficult, therefore the 'which tool to use booklet' was consulted, to compare the different methods of measuring health, and consider their suitability in relation to the project (Communities Living Sustainably & Growing Health, 2016). Initially the Warwick-Edinburgh mental wellbeing scale (WEMWBS) was considered as the most suitable, however the questionnaire was required to be completed multiple times throughout the project, which was not realistic, as participants were only interviewed once (Warwick Medical School, 2021). Furthermore, as the scale relied on self-reporting, it was recognised that there is a possibility for bias in responses, as individuals may feel as though their responses are being judged or compared to other participants (Communities Living Sustainably & Growing Health, 2016). To ensure that the questions considered the role of wellbeing thoroughly and avoided bias, a combination of the Nature Connection Index (NCI) and subjective wellbeing questions were considered most appropriate. The selection process is outlined in Figure 14.

Figure 14.



Adapted from Communities Living Sustainably & Growing Health (2016)

The purpose of the NCI is to consider the role of an individual's engagement with the natural environment, as this is considered a potential mechanism for providing a benefit to physical and mental health (Richardson *et al.*, 2019, p. 2). This method has been used successfully in research by Miles (2019), who considered both children and adults relationship to nature, considering how interacting with the natural environment can encourage pro-nature behaviours (Richardson *et al.,* 2019, p. 1). While not the main aim of the research, similar to this project, the paper considered the validation of "wellbeing" and the difficulties associated with measuring the value, which helped to shape how the NCI was used throughout (Richardson *et al.,* 2019, p. 4). The research by Miles was also recognised in both of Leeds City Council's Local Plan Updates regarding the development of GI and the Parks and Green Spaces Strategy 2020-2030 (Leeds City Council, 2021). Reference to the use of the NCI here further justified the relevance of the chosen technique, as it would further allow for an understanding of greenspace accessibility in Leeds, and the ability to individuals have in connecting with it (Leeds City Council, 2021).

Using the NCI allowed for an initial evaluation of the effects greenspace can have on the health and wellbeing of individuals, by asking a series of questions relating to the participants relationship to nature, ranking the responses. Each response aligned with a rating which allowed a comparison of all participants results when analysing the data. The NCI, provided an opportunity to quantify the emotions and feelings attached with interacting with nature, to investigate the influence of how greenspace is utilised, and the attitudes towards these areas (Richardson *et al.*, 2019, p.17). The NCI was completed at beginning of the interview to help gauge a general understanding of attitudes towards greenspace. This also allowed for a greater exploration of these attitudes throughout the interview. An outline of the NCI is shown in Table 8.

Table 8.

NCI

From Richardson *et al.* (2019)

The subjective wellbeing questions allowed for a greater exploration of the role of greenspace, and considered whether participants found outdoor spaces to be beneficial to their mental and/or physical health (Communities Living Sustainably & Growing Health, 2016). The questions relating to wellbeing were asked when considering how the participant utilises the site, as this allowed for an analysis of the link between the activities undertaken in a greenspace, and the influence this may have on mental and physical health. While certain questions were asked in each interview, the semi-structured nature allowed for a greater exploration of certain topics that participants found influential on their experience of greenspace (Magaldi & Berler, 2020).

As a participant's responses cannot be predicted prior to the interview, having an open discussion allowed questions to be tailored to the individual, as it was recognised that the attitudes towards greenspace, SuDS and the role of wellbeing were likely to be different for each participant, aligning with the philosophical angle of the work (Magaldi & Berler, 2020). The parks included in the study included a SuDS function by having swales, tree planting and amenity ponds, which also allowed for a brief consideration of individuals awareness of green solutions.

This also allowed for a more in-depth consideration of an individual's feelings and emotions when using greenspace, and the role these areas may have on influencing a participant's wellbeing and/or quality of life. This ensured participants felt comfortable in discussing their personal wellbeing, with all questions remaining optional to the participant. This combined approach of both the NCI and descriptive questions ensured that an individual's wellbeing and relationship to nature could be quantified, examining their connection to nature (Richardson *et al.,* 2019, p. 2).

3.5.1 Interview Analysis

Once all of the responses were transcribed, the interviews were uploaded onto NVivo 1.5 to code; similar themes that were discussed identified (Castleberry & Nolen, 2018, p. 808, Lochmiller, 2021). The project objectives provided a basis to form three master categories: Defining Greenspace, The Purpose of Greenspace and Additional Benefits. Sub-themes and codes were created and allocated to the most relevant category, allowing for an initial thematic analysis to consider if there were any common themes throughout interviews that participants referred to. To ensure anonymity of the results collected, when referring to the results in Chapter 5, all participants were given pseudonyms, listed in Table 9.

Table 9.

NCI Values

Participant Number	Pseudonyms
PN1	Steve
PN2	Rachel
PN3	Emma
PN4	Matthew
PN5	Lucy
PN6	Jessica
PN7	Helen
PN8	Louise
PN9	Tom

Due to the subjective nature of wellbeing, it was difficult to apply statistical analyses and conventional tests of significance to the descriptive data, as it was possible to overlook the thoughts and feelings of participants, therefore a focus was placed on a content and discourse analysis. This allowed for the identification of underlying ideologies and attitudes that individuals associate with greenspace (Nelson, 2018). Quantitative methods of analysis were used when comparing the results of the NCI. As participants were asked to rate the same set of questions, it ensured that results could be comparable, therefore using the response scale rating (Table 10), total values were added to create an average.

Table 10.

NCI Conversion Values

	Response Scale Rating						
Statement	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1—I always find beauty in nature	0	1	2	3	5	9	15
2—I always treat nature with respect	0	0	1	2	4	6	10
3—Being in nature makes me very happy	0	1	2	3	6	10	16
4—Spending time in nature is very important to me	0	1	2	3	6	11	19
5—I find being in nature really amazing	0	1	2	3	6	10	17
6—I feel part of nature	0	1	2	4	7	13	23

Note. The response scale rating values were provided by Richardson *et al.* (2019) with a higher conversion number placed on the highest response received, to reflect a greater "connectedness" to nature. The conversion ratings are not consistent for all six statements, as each is attempting to measure a different element associated with nature connectedness, therefore the conversions differ, in an attempt to ensure ratings are comparable The different elements being measured are: emotion, beauty, contact, meaning and compassion (Richardson *et al.,* 2019, p. 3).

3.6 Ethics

It was important that the research was conducted in a manner which aligned with the Coventry University's ethics policy, therefore it was ensured that full ethical approval was granted prior to any form of data collection (see Appendix F). Furthermore, with the project considering mental and physical health, all participants were informed of the nature of the research prior to taking part in both the online questionnaire and interview. It was also ensured that participants had signed consent forms and were anonymised prior to the data collection and analysis.

3.7 Conclusion

The methods undertaken throughout the project were chosen to investigate the role and purpose of greenspace in Leeds, considering the benefits outdoor spaces can provide. A mixed-method approach allowed for a greater consideration of the feelings of participants associated with interacting with greenspace, and the role of wellbeing. While it was recognised that measuring wellbeing is difficult, by using a combination of the NCI and descriptive questions throughout interviews, it ensured that results could be compared, to investigate how valuable participants found greenspace to be. The mixed-method approach shaped the philosophical standpoint of the project, adopting an interpretivist approach, with a recognition throughout that individuals will associate different thoughts and feelings to a space depending on their lived experiences and how they utilise a greenspace (Putnam & Banghart, 2017, p.3).

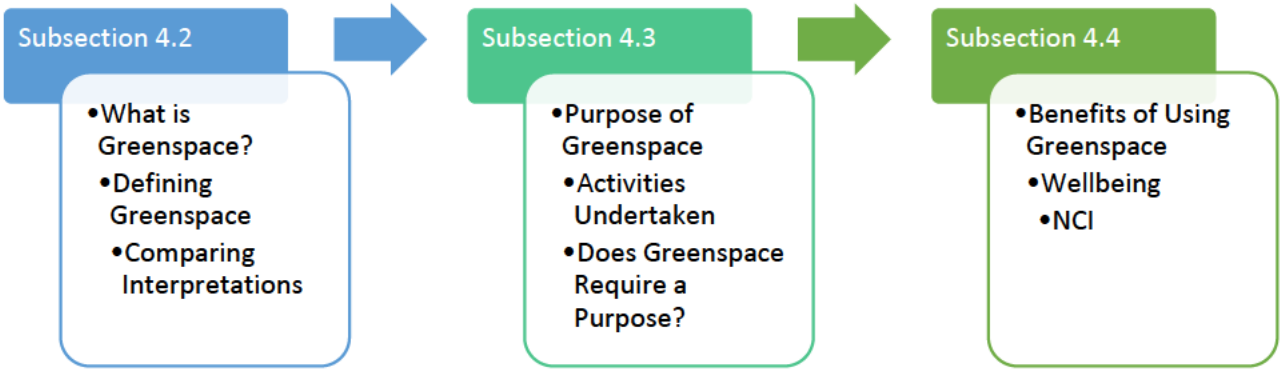
While research into the role of greenspace and physical and mental wellbeing is still emerging, the online questionnaire and semi-structured interviews undertaken allowed the investigation of how greenspace and wellbeing are defined by participants and the purpose of urban greenspace in Leeds. By choosing two study sites which were the same type of urban greenspace, it ensured that the interview findings were comparable, and allowed for an investigation into the role of parkland in influencing physical and mental wellbeing. Furthermore, it was recognised that while the study focused on Leeds, the research outcomes could be applied and replicated elsewhere in other medium to large-sized sized cities in the UK. The project could effectively be applied to different types of urban areas e.g., allotments, public gardens and parks using the same methodology, which would allow for a comparison between the value of greenspace in different cities, to investigate whether the same benefits can be provided.

4.0 Results and Discussion

4.1. Introduction

As the literature discussed throughout Chapter Two highlights, the necessity for greater investigation of the link between greenspace and physical and mental wellbeing, it must be considered how individuals interact with a space, to examine the potential benefits that can be provided as a result. With over 80% of the UK population living in urban areas, greenspace has the ability to mitigate the physical effects of the Urban Heat Island (UHI) effect, reducing the risk of exhaustion, respiratory problems, and heat stroke as discussed in Chapter One, section 1.1 (Li & Zhou, 2019, p. 256). Greenspace can also offer a benefit to mental wellbeing, by providing an environment to reflect, restore and relax in, which is particularly evident when considering the impact of the COVID-19 pandemic (Li *et al.,* 2020, p. 2). The multifunctionality of greenspace is further apparent when considering the contribution of urban and rural green space as an ecosystem service, providing wellbeing, biodiversity and urban development (Wade & McLean, 2014, p. 320). This chapter will therefore examine how individuals define greenspace, whether this aligns with the literature, and the potential influence this has had on how greenspace in Leeds is utilised. By investigating this, it also allows for a greater consideration of the benefits of greenspace and how physical and mental wellbeing is influenced. The chapter outline shown below, in Figure 15.

Figure 15.
Outline of Results and Discussion



The definition of greenspace, nonetheless, changes between disciplines, particularly including non-technical audiences such as the adult lay population since they might have a different understanding to those from a policy making or academic background (Taylor & Hochuli, 2017, p. 28). There must therefore, be an initial analysis regarding how greenspace is defined, in order to consider the influence different interpretations of the term have on the purpose and benefit of these spaces. It is challenging to encourage the development of greenspace, as developers are uncertain what individuals find to be

beneficial (Senik & Uzun, 2022, p. 203). Investment and engagement can therefore be limited, with different interpretations of greenspace not matching definitions on an individual, industrial, council or communities understanding (Senik & Uzun, 2022, p. 205). This is further made difficult when considering the element of power that exists when planning and designing spaces, particularly in urban areas (Lee, 2022, p. 1). It is suggested that there is an uneven geographical development of urban areas, with the design of a city ultimately controlled by those with power e.g., policy makers such as the UK and local governments (Das, 2017, p. 512). Consideration should therefore be given of how the adult lay population defines greenspace, to examine whether greenspace has been designed with the participants in mind (Fuchs, 2019, p. 131, Das, 2017, p. 515). Once this has been achieved, there can then be a comparison against the definitions provided by policy makers, academics, and NGOs, and investigate whether there are any similar themes.

Acknowledging the importance of defining greenspace reinforces the need for a similar analysis on the term "wellbeing" as this element is also subjective. To ensure that the extent of wellbeing benefits can be considered and compared as accurately as possible, it is important to examine how the interpretations of wellbeing influence the human relationship with greenspace (Noe & Stolte, 2023, p. 2). This will not only outline the functions a greenspace can provide, but also suggest the types of benefit (e.g., mental, physical, social, economic etc.) that an individual feels they gain from interacting with nature.

4.2 What is Greenspace 139

As a result of the online questionnaire, 139 fully completed responses were received, with a descriptive analysis of the definitions of "greenspace" provided, highlighting that individuals consider greenspace to be a vegetated, open area such as a park or fields (Figure 16). Greenspace is also associated with being undisturbed by buildings or roads, with a suggestion that the absence of large developments such as offices and residential areas reduces the potential for a greenspace to be 'disturbed'. Some participants reference greenspace as being 'undeveloped land' and areas without any form of development (see Figure 16), which differs from the opinions of academics in chapter two. There was a recognition that greenspace can still exist with the presence of developments, however an emphasis is placed on the importance of having open, vegetated space. Areas with vegetation such as trees, plants, or grass, are highly regarded and favoured by participants, closely aligning with the literature (Browning *et al.,* 2022, p. 6, Barton & Rogerson, 2017, p. 80). It is suggested that by seeing vegetation, participants potentially feel as though they oare playing a role in preserving and restoring the environment, as opposed to these areas being developed upon (Joye & Dewitte, 2019, p. 4). It is

important to consider how this attitude has influenced how individuals define greenspace, with the different definitions and terms used explored throughout this section.

Figure 16.
Respondents Interpretations of Greenspace

The term 'parks' is used the most frequently, mentioned 30 times by respondents. Parks are often closely associated with greenspace throughout the literature, due to their ability to provide an open space in heavily densely populated areas, where outdoor leisure space is typically limited (Taylor & Hochuli, 2017, p. 30). While a park is a singular area of greenspace, on a wider scale the role this type of space can have as being an element of GI must be considered, as parks have the opportunity to connect smaller areas of greenery e.g., through footpaths, woodland areas which may have previously been isolated (Majekodunmi *et al.,* 2020, 1-11).

It is also widely acknowledged that parks can promote physical activity and wellness, proving a space for individuals to engage in walking, running, and cycling (Braubach *et al.,* 2017, p. 2). This is evident when considering the number of publicly accessible infrastructure e.g., trails and running tracks that are available to use in parks (Cohen & Leuschner, 2019, p. 4). Not only does this promote physical activity, but it also ensures that all users of the park have an equal accessibility to facilities such as basic gym equipment, which they may not be able to use elsewhere due to money constraints or the travel involved with reaching these spaces (Cohen & Leuschner, 2019, p. 2). The importance of parks is reiterated in both questionnaire and interview responses (see Appendix G), with it likely that individuals most commonly associate parks as being greenspace, because they use this type of space most frequently as it is closest and accessible to them. This is evident in the responses below:

'Temple Newsam is the place we go most just because of its proximity to our house' ~ Rachel – 18-34 Demographic - Female

'I say Roundhay Park is close as well but we purposely bought a house near the park so we knew it was somewhere we could come to, and we walk around a lot' ~ Emma – 18-34 Demographic – Female

As both Roundhay Park and Temple Newsam are both parks located in urban and suburban areas respectively, they are also more likely to be accessible to a wider demographic , as they are typically free and within walking distance. In both quotes, there is clear reference made to the close proximity of both sites, with Emma highlighting that they deliberately bought a house close to Roundhay Park in order to be able to use the area often. Not only does this highlight the frequent use of parks, but also the value that was associated with having access to greenspace, which was something of great importance to them. Greenspace accessibility is widely considered key to supporting mental and physical wellbeing, therefore ensuring that individuals have access to these areas is crucial in supporting sustainable urban development (Chen *et al.*¸2020, p. 2). This is significant when considering Leeds Parks and Green Spaces Strategy, which aims to ensure that public greenspace in Leeds continue to provide benefits to local communities (Leeds City Council, 2022). The function for the greenspace

outlined in the strategy is to prioritise biodiversity, accessibility and recreational opportunities e.g., providing areas for social interaction, which are all considered equally throughout, highlighting the clear importance of the wider benefits that can be provided as a result of encouraging the use of greenspace (Leeds City Council, 2022, Chen *et al.*,2020, p. 5I). It is evident that individuals find parks to be beneficial, by deliberately choosing to live near areas of greenspace as they are aware that they can improve their mental and/or physical health. Participants also preferred spending time in open space, which offered a range of recreational and social opportunities away from a densely populated area. Based on the sample, the strategy is proving effective, as it is encouraging individuals to interact with greenspace on a regular basis. Furthermore, by highlighting this also suggests that if one singular greenspace can provide these benefits, a network of GI has the opportunity to further ensure this, while connecting greenspace across an area (Yeo *et al.,* 2022, p. 3).

As well as parks and open areas such as farmland, participants have considered areas such as countryside and farmland to also be greenspace. This is significant, particularly as an emphasis is typically placed on the importance of urban greenspace by academics (Lee *et al.,* 2015, p. 133). It is evident that there is a difference between urban and rural greenspace, potentially due to issues of accessibility to rural areas (Chapter two, section 2.2) . While both types of greenspace have the potential to provide the same functions and benefit, it is likely that participants have made reference to rural areas due to their appearance, and lack of development, which individuals dislike. Mentioning rural areas such as farmland, suggests that individuals consider and value a wider variety of outdoor spaces, extending beyond the city centre. It is possible that while individuals consider rural areas to be greenspace, they may also feel as though these types of areas are what most closely link with their perception of what greenspace is, unlike urban areas where the participants visit, where most greenspace has either been intentionally built or altered to 'fit' in with the surrounding landscape (Mears *et al.,* 2019, p. 129). Considering rural areas as greenspace also raises the importance or potential barrier of accessibility, as it can be suggested that unless an individual lives near farmland or the countryside, they may feel as though have to travel outside of an urban area or city centre to reach what they consider to be greenspace; these areas are also not equally accessible or open access for everyone, with most areas of farmland being private access (Taylor & Hochuli, 2017, p. 30). Poor transport links and affordability further restricts this. It is also likely that for some living in an urban area, knowledge of the preparation necessary for visiting the countryside presents a barrier e.g., being unaware of the countryside code or not wearing appropriate clothing for walking trails. Poor accessibility to greenspace has been considered one of the main barriers to encouraging individuals to interact with nature, with a fair and equal access to greenspace like parks crucial in ensuring the natural environment can be enjoyed by people of all ages and disabilities (Sensory Trust, 2023, Long *et al.,*

2022, p. 2). The importance of ensuring an equal level of accessibility was reiterated throughout the questionnaire responses, as evident in the quotes.

'I really believe such sites need to be made more easily accessible to disabled and mobility restricted people, who would benefit physically but most importantly their mental well-being I believe would be greatly enhanced' ~ Questionnaire Participant 97

'I know that before I had my driving license I couldn't access larger green sites like National parks or AONBs as public transport there is terrible. I also think there is still a level of elitism in spending time in certain green spaces like wild areas or national trust sites because of cost but also a lack of appropriate clothing or knowledge on how to behave' '~ Questionnaire Participant 88

Note. Unlike in-person interviews, the socio-economic backgrounds of respondents was not collected as part of the questionnaire, with the majority of participants uncomfortable with sharing this information.

There is a clear sense that participants highly value accessibility and feel that this is crucial in ensuring a greater audience receive benefits from interacting with outdoor space (Sprague *et al.*, 2022, p. 667). Without improved accessibility, it is possible that individuals may feel restricted to only using certain areas of greenspace, as they are unable to reach those located in rural areas. There may be an element of a lack of confidence in utilising greenspace, potentially due to perceptions of who typically utilise greenspace e.g., the stereotypes associated with teenagers and crime and/or antisocial behaviour (Sprague *et al.*, 2022, p. 667). This may deter certain audiences e.g., groups of youth, as this demographic is often portrayed in a negative light, often presented as a barrier to using greenspace, despite the fact antisocial behaviours is only representative of a minority of this group (Madzia *et al.*, 2018, p. 233).

The word 'beaches' was mentioned once in the questionnaire, which is important, since beaches do not typically represent areas of greenery or vegetation (Taylor & Hochuli, 2017, p. 25, Mosely *et al.*, 2013, p. 5). Both the ONS and UK government suggest that greenspace must be vegetated (see section 4.1.1), however this is not the case with beaches, unless there are palms or mangrove trees, not native to the UK (Dutton & Engledew, 2020, Fenu *et al.*, 2012, p. 500). The consideration of beaches suggest that participants place a greater focus on the space itself, regardless of whether it is 'green' or not. It is possible that instead of considering a space to be 'green' or 'blue', there should instead be a focus on the space being outside and part of the natural environment instead. It is possible that individuals consider beaches to be more 'natural' than parks, as they are less formal and manicured in comparison. Individuals already consider most outdoor areas (parks, farmland, beaches, gardens, and

open space) to be classified as greenspace, therefore it would be reasonable to place a greater emphasis on the space being outdoors as opposed to 'green'. Since an area like a beach can provide the same benefits as a park, if a space is providing the same multifunctionality and benefit, considering them together is rational.

4.2.1 Greenspace as a Multidisciplinary Subject

Results from questionnaire and interview responses were generally similar to the definitions of greenspace provided by policy makers and NGOs. Like the general public, the UK government, academics, and NGOs consider greenspace to be an area of vegetation, with an emphasis placed on areas such as parks, woodlands, and fields (Taylor & Hochuli, 2017, p. 27). The definitions closely align with the literature discussed in Chapter Two, section 2.2 as evident in the questionnaire response excerpts.

There are slight variations regarding the specific areas that constitute greenspace, as well as a lack of clarity by some academics (e.g., engineers and psychologists) as to whether greenspace can only be urban, or if rural areas are also included in their definition of the term (Browning *et al.*, 2017, p. 2). One example of this can be seen when comparing how NGOs and the UK Government consider greenspace (Figure 17). Here, parks and greenspace are considered separately, even though the public and academics suggest anywhere with vegetation to be a greenspace. Not only does this reiterate how differently "greenspace" can be interpreted, but it makes it further challenging to ensure that a space "fits" the preferences of those of use it. The ambiguity associated with "greenspace" is further emphasised when considering the data collected, with questionnaire participants placing an emphasis on the importance of a greenspace being 'undisturbed'.

'A space that is undisturbed by infrastructure and is predominantly grass' ~ Questionnaire Participant 6

'Untouched areas of land, not build on' ~ Questionnaire Participant 76

'An "open" space with plants and wild life, hopefully far enough away from roads to be able to hear "nature" and not "civilisation' ~ Questionnaire Participant 29

While participants did not expand on what 'undisturbed' meant, the results suggest that there should be a collaborative approach between those with creating greenspace and the audience (e.g., the lay population or community in the area) utilising the space (O'Donnell, 2021, p. 1, Van der Jagt *et al.*, 2019, p. 758). With the UK Government influencing funding and local decision making regarding greenspace, it is evident that there is sense of power over those utilising outdoor space, with policy makers being those who fund and create greenspace (Das, 2017, p. 512). Despite this, Leeds City

Council and the UK Government should base design and funding on elements that the public find most beneficial e.g., children's play areas or amenities such as cafes, as evident below (Jabbar *et al.*¸2021, p. 4405).

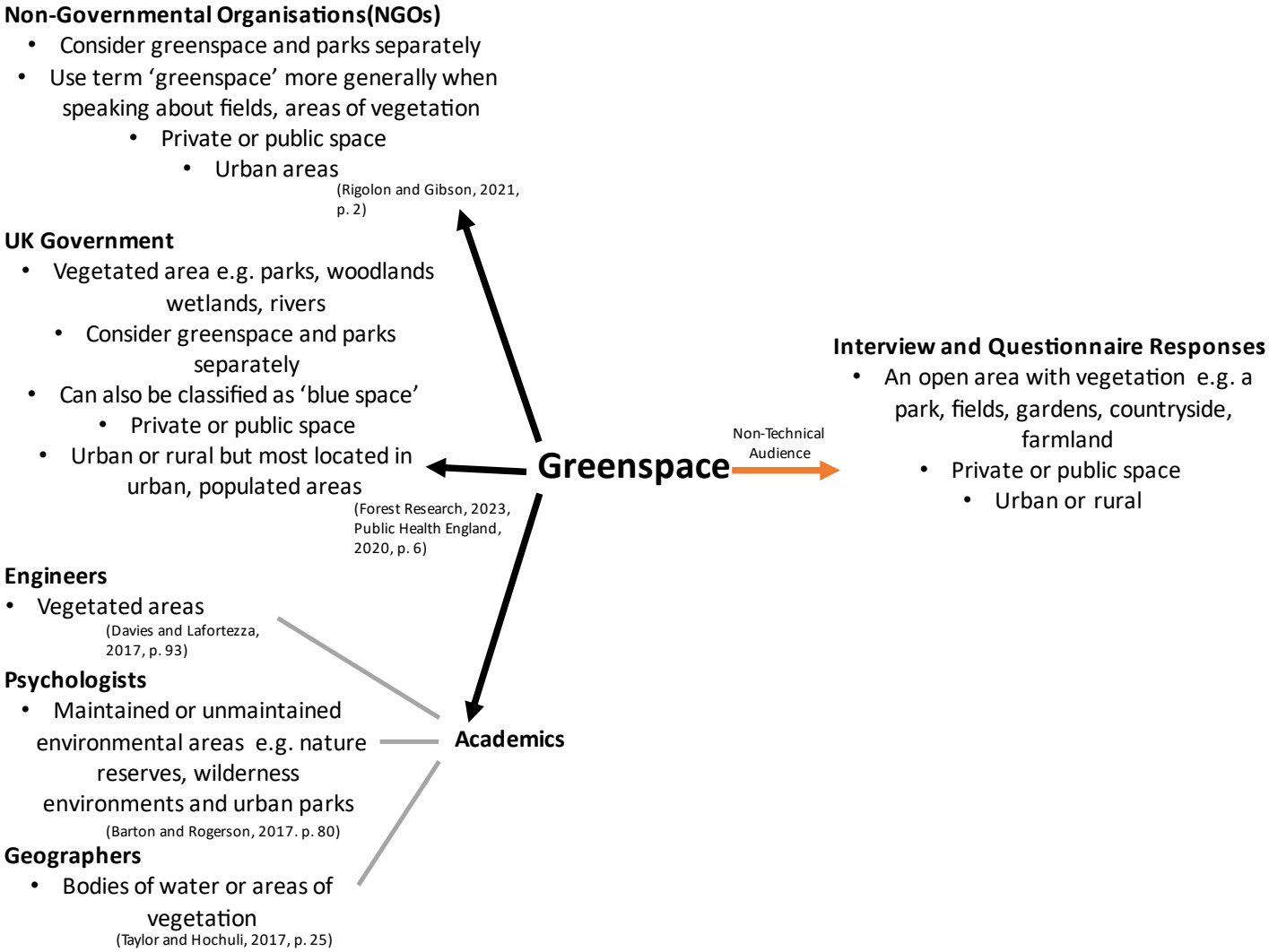
'Eating and drinking facilities gives you a reason to stop and take it all in' ~ Questionnaire Participant 26

'Play areas for children, benches, cafe to grab a coffee then walk!' ~ Questionnaire Participant 1

Without a collaborative approach between disciplines, it may lead to confusion by developers and engineers who design greenspace, as there is a lack of clarity surrounding the specific areas classified as greenspace, and also the potential to not implement features e.g., amenity buildings, that individuals find beneficial (Hansen *et al.,* 2019, p. 101). As evident in Figure 17, there is a variation in how "greenspace" is defined, reiterating the necessity of a new, collaborative approach.

Figure 17.

Definitions of Greenspace Defined by the Key Pieces of research used by the UK Government, NGOs and academics



Created by Author (2023)

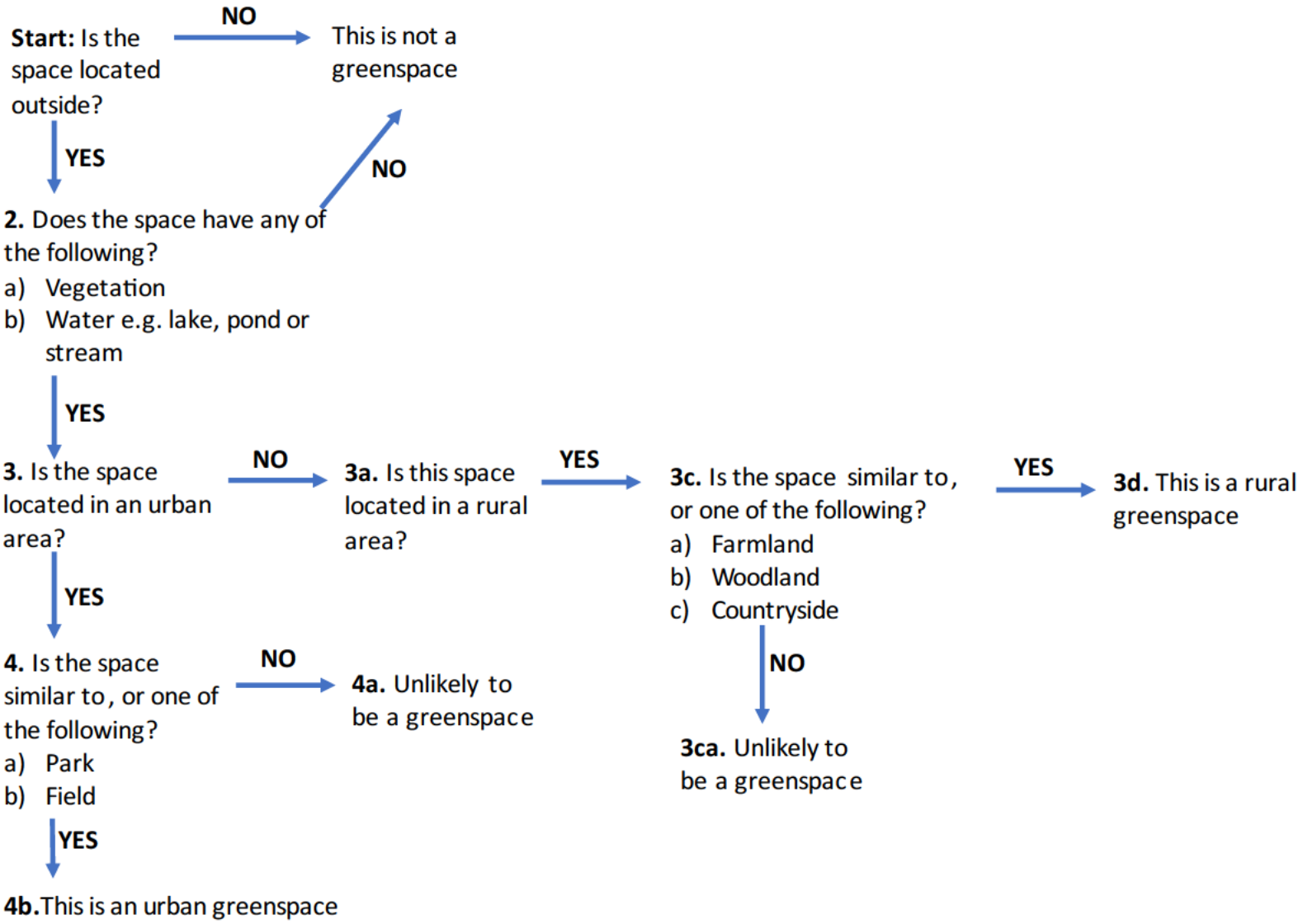
The different definitions and interpretations of what greenspace is, reiterates a need to have a descriptor dependent on how formal or informal a greenspace is. Figure 17 highlights the definitions of only three types of academics, due to the lack of clear interpretations provided throughout academic research, further reiterating the need for greater communication. In addition, achieving this will ensure that greenspaces are able to facilitate pro-nature behaviours, further benefitting health and wellbeing. There must be a clear method of identifying the type of space being discussed, to ensure that the general public, academics, NGOs, and policy makers have a shared understanding of what greenspace is, as opposed to having multiple interpretations. This approach must also consider a consultation with certain groups e.g., youths, those from different ethnic and religious backgrounds to ensure that all who interact with a greenspace, feel an equal right to use a space (King, 2018). A shared understanding is also necessary within disciplines, for example when considering the variation between academics, for example,. economists are likely to have a different interpretation when comparing to geographers or urban planners (Taylor & Hochuli, 2017, p. 26). For example, economists place a greater emphasis on the cost associated with the development and maintenance of an area, in comparison to a geographer, who focuses on how nature can benefit an individual, and benefit their wellbeing and quality of life (Sprague *al.,* 2022, p. 670). Figure 17 may oversimplify the number of definitions relating to greenspace, for example, not all geographers will adopt the same definition of greenspace, however, it is clear that a greater level of communication is required.

A collaborative approach which is both muti- and interdisciplinary, is key to encouraging uptake not only of greenspace, but also green solutions such as SuDS, as suggested in Chapter Two, there must be a set of criteria to support greenspace understanding and designation, created by all disciplines involved in developing and studying greenspace, incorporating the interpretation outlined in Figure 17. To support the examination of greenspace and its role in improving wellbeing, criteria allowing a definition of greenspace has been developed, incorporating the definitions discussed above, alongside the interpretations provided in Chapter Two, section 2.2 (Xu *et al.,* 2019, p. 245).

Figure 18 proposes a means of identifying greenspace, ensuring that each sector e.g., policy makers, engineers, geographers and psychologists identify greenspace the same way, allowing for a clear understanding of the term. The aim of Figure 18 is to aid the designation of greenspace and provide a clearer way of identifying whether an area is considered 'green' or not. This method enables an initial examination of greenspace, as the questions do not go into depth regarding the size or purpose of the area being considered, however by providing a set of questions or criteria which every discipline must follow, it ensures that the understanding and application of greenspace is similar (Yang *et al.,* 2021, p. 2).

Figure 18.

Provisional Descriptors to Define Greenspace



Created by Author (2023)

With much of the literature considering greenspace as either rural or urban, the criteria closely follow this. While questions 4a and 4b (Figure 18), do not provide an exhaustive list of examples of urban and rural space, the aim is to distinguish what features the space has, to examine whether the area is rural or urban. To classify an area as 'urban' or 'rural', DEFRAs 'Rural Urban Classification' has been incorporated. Urban areas are considered as 'connected, built-up areas' (see chapter three, section 3.2.), that have a population above 10,000 people, with rural areas consisting of a population below 10,000 (DEFRA, 2021). Both questions 4a and 4b could be adapted to include additional examples of urban and rural greenspace, to ensure a suitable classification.

It is also important to recognise that solutions such as SuDS are on a completely different scale to greenspace, with this likely having an influence on the level of value and benefit an area can provide (Senik & Uzun, 2022, p. 205). While this does not necessarily influence Figure 18, and how a greenspace is classified, there must also be a recognition that where a SuDS device, greenspace or GI are being considered, it is acknowledged that where the size of a space increases, the benefits provided by a space will likely do the same (Cleary & Hunter, 2017). By first defining "greenspace" it will also allow for a greater consideration of how SuDS can be incorporated into areas such as urban parkland's, allowing greenspace and SuDS to work alongside one another, as opposed to being separated, as evident in Chapter Two, section 2.4. Achieving this not only improves the knowledge surrounding the necessity of these practices, but it further ensures a collaborative approach between disciplines (Van der Jagt *et al.,* 2019, p. 759). It is also preferable from a health and wellbeing perspective, as it will maximise the opportunity to provide the greatest amount of benefits to an individual (Markevych *et al.,* 2017, p. 303).

4.3 Purpose of Greenspace

Both questionnaire and interview responses highlight that greenspace is predominantly used for physical exercise and socialising. Out of 135 questionnaire responses, 109 participants mentioned physical activities such as dog walking, running, and cycling, with some mentioning exercise groups they were part of, including running clubs and weekly park run events. Four individuals mentioned the phrase 'walking meditation', how they use greenspace to take part in mindfulness exercises, with responses showing how physical activities such as walking, are a form of mediation when listening to the sounds and visual elements e.g., trees and flowers. When considering this on a wider-scale linking to GI, there is an opportunity to develop more connected areas which can ensure that individuals gain this element of mindfulness they associate with greenspace. By ensuring GI in cities is a network of that encourages these interactions, it is likely to increase the number of individuals who partake in mindfulness exercises and physical activities, which is key to improving quality of life and health (Kim

& Miller, 2019, p. 6). The ability greenspace has in providing a form of meditation is interesting, as it suggests that exposure to a greenspace allows for individual's stress response to 'shut down', evoking positive emotions instead (Zhang *et al.*, 2021, p. 1).

'*When the weather gets nicer we go on longer walks*' ~ Rachel – 18-34- Female

'I think as well it changes with your stages of life because I know that there's loads of mummy groups that come here and like if you were to ever do a walk mid-week there'll be so many different groups of people hanging out' ~ Matthew – 18-34 - Male

As stated by Matthew, it is clear greenspace can be multifunctional, with the purpose of greenspace changing depending on age, gender, occupation, and stage in life (Sprague *et al.*¸2022, p. 668). While the specific benefits of multifunctional greenspace were not mentioned by participants, it is evident that functions can be social, ecological, and economic to name a few (Breuste & Artmann, 2002, p. 400, Lahde *et al.*, 2019, p. 10). The feasibility of multifunctional greenspace in a dense urban landscape appears difficult, however it is crucial where there is limited space, which may be achieved through strategic planning designs, which ensure that the social, cultural and recreational opportunities that could be provided are present (Hansen *et al.,* 2019, p. 101). With the development and use of urban greenspace encouraged, it is therefore desirable to provide a space which can enable multiple activities and provide multiple benefits.

'Space in which vegetation is dominant as land cover that might be used for a variety of functions and aesthetics' ~ Questionnaire Participant 11

As discussed in Chapter Two, subsection 2.3.1, multifunctionality is key to successfully implementing a greenspace, providing benefits to both the environment and people (Roberts *et al.*, 2022, p. 1, Bell *et al.*, 2014, p. 287). To maximise the space available in Leeds to ensure it is multifunctional, it must therefore be ensured that greenspaces, and on a larger-scale GI optimises both the location of a space, to ensure accessibility to all, and enforce features e.g., playgrounds, footpaths etc, that individuals find most beneficial (Tran *et al.,* 2020, p. 3). However, as mentioned in section 4.2, this is difficult due to a lack of collaboration which continues to present an issue (O'Donnell, 2021, p. 1). As there is limited space in Leeds city centre, it is importance to ensure that where greenspace exists, it is able to enhance an area providing multiple functions that benefit the entire community, as opposed to creating a space which is restricted to providing a single function (Roberts *et al.,* 2022, p. 9). Alongside this, the cost of urban developments is typically considered the main issue when planning and developing GI and greenspace, with the importance of communicating between different disciplines often disregarded (Zuniga-Teran & Gerlak, 2019, p. 2). There have been a number of projects e.g., Rae Valley Urban

Quarter in Birmingham, which aim to create a connected multi-use green area alongside the River Rea, however once again, the plans of developers did not meet those of policy makers creating an issue when it came to developing the space (Birmingham City Council, 2020). If there had of been a communication prior to submitting these plans, it could have ensured that a space which equally considered the visions of developers and policy makers, as opposed to disregarding features policy makers did not deem as beneficial (Birmingham City Council, 2020).

To ensure a greenspace can be as effective as possible, there must be a multidisciplinary, collaborative approach between academics, policy makers, NGOs and those utilising a space, to ensure that social, environmental, recreational and economic benefits are provided concurrently (Hansen *et al.,* 2019, p. 101). Academics are key to achieving this, with a clear need for research to underpin why GI, greenspace and SuDS are necessary. By communicating the purpose of green solutions to policy makers, NGOs etc., it will in turn enable there to be conversations between all involved. In achieving a collaborative approach, it will not only ensure greenspace is designed appropriately, and is beneficial to a larger population (due to its multiple functions), but also potentially increase the recognition of the full scope of benefits a greenspace can deliver, displaying the variety of ecosystem services (e.g., ecological, social and cultural benefits) that can be provided (Roberts *et al.,* 2022, p. 6).

4.3.1 Does Greenspace Require a Purpose?

It is evident that greenspace can be multifunctional, however it is important to consider whether every greenspace is required to provide a purpose. While greenspace will always provide an environmental or ecological benefit by having vegetation, it is recognised that greenspace does not necessarily have to have a function. Whilst interview responses indicated that individuals used greenspace in Leeds for specific purposes e.g., to exercise or to socialise, this does not mean that every single area of greenspace or patch of vegetation should be expected to provide that same purpose, illustrated in the following quote:

'When you come to a greenspace the whole purpose of that is to just be in the greenspace, a lot of things now seem to be multifunctional, you work and live at home or you study at home or whatever it is and then in your job you have? multiple roles, so it's nice to be able to come to a greenspace and just do one thing' ~ Louise – 35-49 - Female

The quote by Louise, shows the recognition that while greenspace can provide multiple uses and benefits, it may be completely different to the usual environments the individual interacts with. There is a sense that the role of a multifunctional space is different in greenspace, with the participant separating multifunctionality in a home environment to that of greenspace. Multifunctionality in the

home can be linked to working and/or chores, therefore this environment can be viewed as far more restricted in comparison to greenspace, which is separated from these distractions (Wade & McLean, 2014, p. 320). It is clear that greenspace can provide a social, recreational, economic and environmental benefit simultaneously to an area, however it should also be recognised that greenspace can still be beneficial without providing a benefit to everyone (Hansen *et al.,* 2019, p. 103). Particularly where small areas of greenspace are concerned e.g., grass verges, it is difficult to provide a social or recreational benefit due to the size of the space (Belmeziti, *et al.,* 2018, p. 3). Despite this, having greenspace here is still beneficial and favourable over implementing nothing at all, as these areas have the potential to improve infiltration and the biodiversity of an area (depending on the vegetation present), which remains an issue in residential and highly developed areas (Zuniga-Teran & Gerlak, 2019, 3). While individuals may not view a small patch of greenspace to have a direct positive impact on them, it does not mean that these spaces should be disregarded (Hansen *et al.,* 2019, p. 100). It is evident that some recognise this, with Jessica suggesting that the size of a greenspace can influence its value and quality.

> '*I'm very literal because the grass is green I will class that as a greenspace because it is a place of nature, but I don't class a patch of grass to have the same value or quality as each other. A grass verge I would class as nice to look at, but not directly beneficial to me'* ~ Jessica – 18-34 - Female

While it is evident that there must be a greater awareness of why greenspace of any capacity is preferred over not acting at all, individuals clearly value a space that can provide multiple functions and benefits to them (Roberts *et al.,* 2022, p. 3). Greenspace does not necessarily have to provide a purpose for everyone, however where multiple functions are possible, it is important to make the most of on this, to continue to encourage individuals to interact with outdoor space (Belmeziti, *et al.,* 2018, p. 3).

4.4. Wellbeing and the Benefits of using Greenspace

As shown in section 4.3, individuals generally consider greenspace to provide social, recreational, and environmental benefits. The importance of quality of life and wellbeing were mentioned frequently in the data; therefore, it must be considered how individuals define wellbeing, and the elements they consider to be a part of this. As well as considering how participants define greenspace and how these areas are utilised, it is also important to investigate the potential benefits outdoor environments can have (Lee, 2022, p. 3). With much of the literature highlighting that greenspace can provide added benefits to physical and mental wellbeing, it is important to consider if individuals receive these benefits in reality. In defining wellbeing, the role of greenspace can be measured using NCI (Chapter Three, section 3.5), to consider an individuals' relationship with nature (Masterton *et al.,* 2020, p. 2,

Taylor & Hochuli, 2017, p. 25). Consequently, this section will consider if and how participants receive a benefit from interacting with greenspace, and the role of wellbeing.

4.4.1 What is Wellbeing?

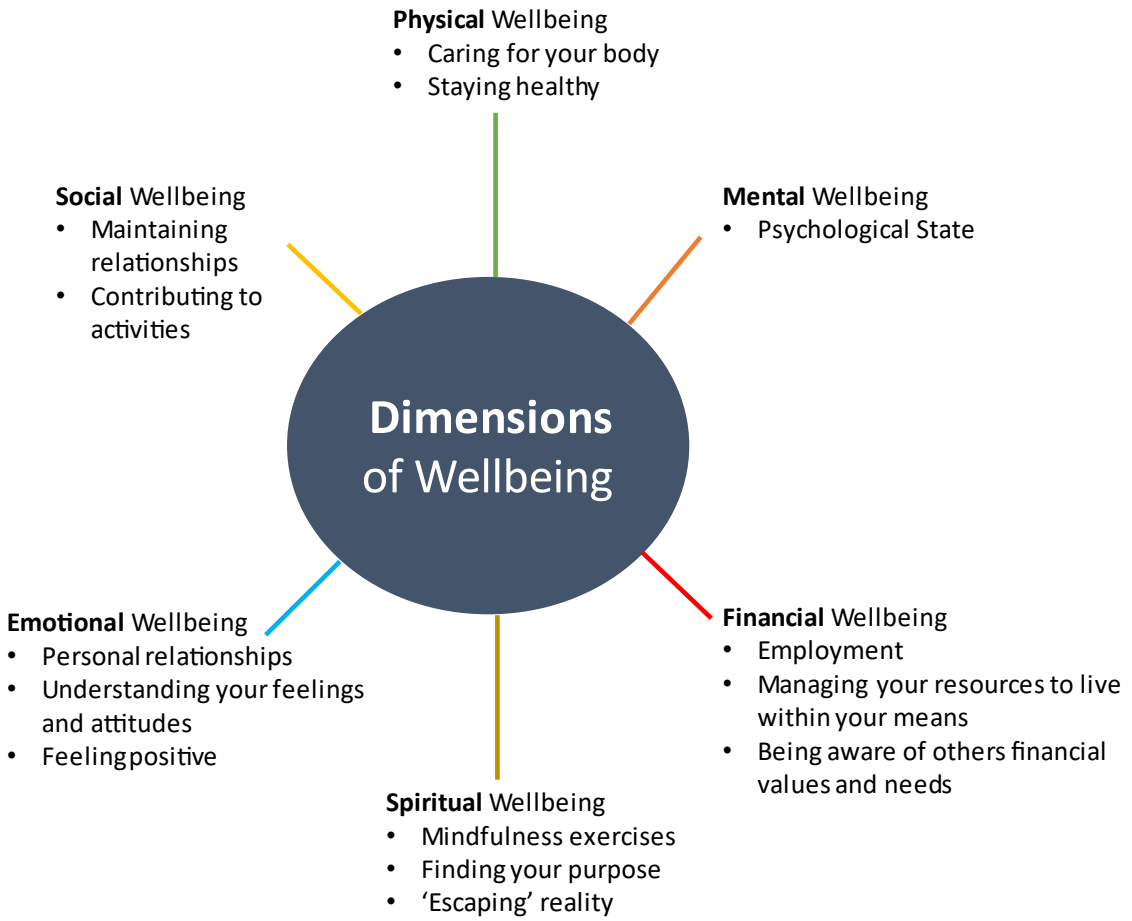
As mentioned in Chapter Two, wellbeing is often considered as 'life satisfaction' and level of happiness, however due to the subjective nature of the term, this has led to multiple interpretations (Hansen *et al., 2019, p.* 105). To examine the potential benefits greenspace can provide, it is first necessary to consider how individuals have defined "wellbeing". When asked to explain their interpretation of wellbeing, participants' responses were similar, closely aligning with the definitions provided in Chapter Two, section 2.6. Individuals consider wellbeing to be both a mental and physical state, providing an element of calmness and ability to relax and improve quality of life, as seen below:

'I think of wellbeing I think of I think I slightly go to the more mental side' ~ Lucy – 35-49 - Female

'I also don't think you could have one without the other' ~ Helen – 35-49 - Female

'There's also a strong correlation between just being outside and physical exercise improving your wellbeing as well and I tend to blend them all together' ~ Steve – 50-64 – Male

It was widely considered that the mental and physical elements are closely linked to one another, with a suggestion that improved physical wellbeing can improve mental state. To benefit wellbeing, it is suggested that factors such as diet, sleep and physical activity can improve mood, energy, and alertness, benefitting an individual's mental and physical health (Ruggeri *et al.,* 2020, p. 3). Greenspace can play a role in providing these benefits by encouraging individuals to interact with nature through physical activity, which can in turn, benefit an individual's mental and psychological state (Barton & Rogerson, 2017, p. 83). Mental and physical wellbeing are considered to be interrelated aspects of health throughout the literature, with medical journals and health sciences placing an emphasis on the physical health benefits, in comparison to human geography and psychology focusing on mental wellbeing (Zhang *et al.*, 2020, p. 1, Bell *et al.*, 2017, p. 94). The elements of wellbeing considered by respondents are highlighted in Figure 19, which gives the most popular phrases associated with the different elements associated with "wellbeing".



Adapted from Stowen (2017)

All six elements of wellbeing were mentioned by each respondent during the interviews, with a recognition that whilst wellbeing is predominantly a physical and mental state, there are additional elements such as financial position and feelings of mindfulness which need to be considered (Garcia-Mata & Zeron-Felix, 2022, p. 145). It is important to consider financial health in particular as a measure of health, particularly when considering how an individual's ability to manage finances and debt can influence their physical and mental capability and desire to benefit these elements (Weida *et al.*, 2020, p. 1). Financial wellbeing is of particular importance when considering the role of the COVID-19 pandemic, which resulted in effects on the economy for households (Barrafem *et al.*, 2020, p. 1). Reference to financial health was mentioned by some of the participants, highlighting that individuals are aware of the potential role cost can have in their use and access to greenspace.

'*Privately owned greenspaces make it difficult for low income people to easily access spaces near them, therefore they cannot use them or benefit from them. They won't benefit if its unavailable for them'* ~ Questionnaire Participant 39

'Some greenspaces may require an entry fee or car park costs, which may discourage or prevent people from visiting them, we don't all have the money for this' ~ Questionnaire Participant 8

Individuals are aware that wellbeing can take multiple forms, with an acknowledgement that interacting with greenspace can target and improve multiple dimensions of wellness (Trudel-Fitzgerald *et al.,* 2019, p. 6). Despite a recognition that wellbeing can extend beyond mental and physical health, the subjectivity of the term was clearly brought out with different participants mentioning different dimensions, such as economic, social and spiritual wellbeing (Garcia-Mata & Zeron-Felix, 2022, p. 150). Additionally, while individuals mentioned the importance of being outside, and removing themselves from stressful situations, there was a suggestion that fresh air, walking and looking at specific features in greenspace e.g., looking at flowers or meadows, aided the improvement of feelings of wellbeing. While urban areas are typically associated with poor air quality and pollution, greenspace is able to provide a 'buffer' to mitigate the UHI effect, providing reduced temperatures and an improved air quality (Gunawardena *et al.,* 2017, p. 586). These elements were commonly identified throughout the questionnaire and interview responses.

'*I like the sounds of the birds singing*' ~ Lucy – 35-49 - Female

'*Fresh air as well plays into it, I think the noise as well that plays into it as well, you know if I can walk through a greenspace and avoid going along a main road that's quite noisy its much more pleasant just on its own*' ~ Matthew – 18-34 - Male

'It's seeing nature and seeing other people, I could just go sit in a big field with nothing there' ~ Louise – 35-49 - Female

It was recognised that defining wellbeing was difficult, however it is clear that individuals have a relatively similar understanding, and value the potential greenspace has in improving health (Rokach, 2019, p. 2). The links between the physical and mental elements of wellbeing are evident when considering the elements of wellbeing referenced (Figure 19), with suggestions that if an individual addresses each of these, their feelings of wellbeing will improve (Trudel-Fitzgerald *et al.,* 2019, p. 8, Stoewen, 2017, p. 862). There was also a sense that to consider an individual's wellbeing, multiple factors need to be considered which may influence it, as is stated by Lucy:

'I think its looking at a person as a whole isn't it, because if you're not physically well that affects your mental health and your mental health can affect your physical health so I think it's looking at that person as a whole person and taking everything into consideration' ~ Lucy – 35-49 - Female

As mentioned by Lucy, to consider an individual's wellbeing, it is necessary to be 'looking at a person as a whole' considering their quality of life and personal circumstances, and the influence this has on

their productivity and desire to interact with greenspace. This response is significant, as it highlights that individuals are aware that wellbeing is subjective, but that it can also change, and be influenced differently depending on an individual's personal circumstances (Voukelatou *et al.,* 2021, p. 279). Lucy's response also suggests that improving wellbeing and benefitting from greenspace are context dependent and can change depending on the individual (Watson *et al.,* 2023, p. 1). It is possible that while participants are aware of the multiple dimensions of wellbeing, a greater focus is placed on physical health, due to the connotations of the word 'health', which is typically closely associated with an individual's physical state (The Wellbeing Thesis, 2023). With Lucy mentioning the importance of considering all factors (mental health, physical state etc.), there must be an equal recognition of both an individuals mental and physical health, as if one declines, it is likely that the other will also as a result (Ohrnberger *et al.*, 2017, p. 45).

The results have closely aligned with the literature, with an importance placed on 'physical wellness' which is often well reported (Hernandez *et al.*, 2017, p. 18). It is widely accepted that physical and mental wellbeing are closely linked and can have an influence on one another (Zuniga-Teran & Gerlak, 2019, p. 18). The importance of mental wellbeing must be considered equally, particularly as the two are closely linked, and can influence one another, however it is evident that individuals are less certain of the reasoning behind this (Barton & Rogerson, 2017, p. 81). By having the knowledge that the natural environment can benefit physical and mental wellbeing on a small-scale, it also highlights the opportunities for GI. It is possible for urban areas to incorporate features e.g., trees on streets, green roofs or greenspace to further provide this benefit on a much wider scale, encouraging an improved mental and physical wellbeing across a larger area (Kumar *et al.,* 2019).

4.4.2 Nature Connection Index (NCI)

While it was recognised in Chapter Two, section 2.10 and Three, section 3.5, that measuring wellbeing is difficult, the NCI allows an examination of an individual's relationship to nature. Nature 'connectedness' is emerging in the literature and is considered key to building a sustainable relationship between people and nature (Miles, 2019). This is of particular importance when considering the UK Government's 25 Year Environment Plan (YEP), which includes policies to improve people's relationship with nature and promote the mental and physical wellbeing benefits that can be achieved (Miles, 2019, Department for Environment, Food & Rural Affairs, 2018). Six key policy areas are mentioned, with connecting people to nature in order to improve health and wellbeing being one of the main focuses, as listed.

I. Clean Air
II. Clean and plentiful water

III. Thriving plants and wildlife
IV. A reduced risk of harm from environmental hazards such as flooding and draught
V. Using resources from nature more sustainably and efficiently
VI. Enhanced beauty, heritage and engagement with the natural environment

While the true success of the project will not be known until 2043, it is important to promote the benefits of pro-nature behaviours (e.g., going for a walk in a park) to encourage the general public to interact with the natural environment (Department for Environment, Food & Rural Affairs, 2018). However, It is evident in the Landscapes Review by Julian Glover that youths and those aged between 18-34 are generally overlooked by the policy areas outlined in YEP, despite the fact that aim of the plan is to ensure a sustainable relationship with nature is accessible for all (DEFRA, 2022). Including a younger demographic in the plan is further strained when considering the UK Government's plans to reduce spending and cutback on some of the pledges set out in YEP (Else, 2022).

With the necessity for a change in the way humans interact with the local environment from a policy perspective, it is evident that a defined, measurable index should be used to provide an insight into the role of nature and the potential influence this may have on physical and/or mental wellbeing (CIEEM, 2019). Individuals have a clear preference for greenspace over grey infrastructure, however, quantifying the health and wellbeing benefits of specific features e.g., a small rain garden, is much more difficult when comparing to a large-scale park (Kasprzyk *et al.,* 2022, p. 2). The latter is more likely to be seen as a 'destination' to visit as opposed to a small raingarden, that is built as an alternative to a grass verge or a cemented area, to improve an areas visual appearance and ability to improve infiltration rates (Kasprzyk *et al.,* 2022, p. 6). This reiterates the necessity to consider a greenspace and/or green solutions purpose and benefit (subsection 4.3.1), which can change depending on the size (Taylor and Hochuli, 2017, p. 26). It is therefore crucial to investigate people's affective and experimental relationship to nature, using the NCI, to examine each pathway to nature connectedness: emotion, beauty, contact, meaning and compassion (Miles, 2019). The results collected from the NCI are given in Table 11.

Table 11.

NCI Results with the Associated Conversion Values used to Calculate "Connectedness to Nature"

Participant	Gender	Age	A) I always find beauty in nature	B) I always treat nature with respect	C) Being in nature makes me very happy	D) Spending time in nature is very important to me	E) I find being in nature really amazing	F) I feel part of nature	Connection to Nature Index
Steve	Male	50-64	5	4	3	6	3	4	25
Rachel	Female	18-34	15	10	16	11	10	7	69
Emma	Female	18-34	5	6	6	6	6	4	33
Matthew	Male	18-34	5	4	6	11	3	2	31
Lucy	Female	35-49	15	10	16	19	17	13	90
Jessica	Female	18-34	9	10	6	6	6	7	44
Helen	Female	35-49	15	10	16	11	10	4	66
Louise	Female	35-49	15	10	10	11	6	7	59
Tom	Male	35-49	No Response	No Response	No Response	No Response	No Response	No Response	0
									52.12

Note. Tom chose not to answer the NCI, resulting in "No Response" in this column.

With an average of 52.12, there is a relatively equal split between those who feel connected to nature in Leeds and those who do not, with scores closer to 100 inferring a greater connectedness than scores closer to 0. There is a relatively large range between responses, with connectedness to nature ranging between 25 and 90. Typically females score higher than males, with higher scores on statements A, B, C and D, with the highest male score of 31, as opposed to the highest female score of 90. While there are lower scores in the 18-34 category which suggest a lower connection to nature, there is a large range between the lowest (31) and highest (69) result. The inequality between the results is also evident throughout the questionnaire responses, with females interacting and utilising greenspace more frequently than men (Table 12). A comparison of responses from male and female participants was chosen as no questions regarding socio-economic characteristics were asked during the online questionnaire, due to participants feeling uncomfortable providing this information.

Table 12.

No. of Participants Who Interact With Greenspace

No. of Participants that actively use greenspace (4+ Hours Weekly)	
Female	93
Male	40

Despite the questionnaire respondents not using the NCI, a greater number of females felt a greater connectedness to nature, which encouraged them to visit and utilise outdoor space on a more frequent basis. There are likely to be multiple factors which influence this, with some limitations of associated with comparing these results, for example, fewer males took part in this area of the study, therefore there were fewer results to compare, with the male responses not truly representative of the entire population. There is however, a clear difference between male and female responses as suggested in Table 11, suggesting that gender has had some influence on how connected an individual feels to nature.

One reason why females may feel more connected to nature is potentially due to the way they interact and interpret greenspace, with the way in which the senses are interpreted (vision, hearing, touch etc.) playing a key role (Barber, 2020). Barber (2020) suggested that women have a better visual memory of objects far in the distance e.g., being able to point out ripe fruit on a tree or distinguishing the different flowers in a meadow. This is potentially due to women being more attuned to colours including black, pink yarrow and blazing yellow (Barber, 2020). With a shift in colour preferences due to the rise in sustainable practice and trends associated with being environmentally friendly, there has been a preference and attractiveness of neutral colours such as beige and brown (Fider & Komarova, 2019, p. 7). The colours of vegetation closely align with such muted colours, so it is possible that this has had

an influence. It is therefore likely that female participants identify and focus on certain areas in a site such as flowers, trees, or bodies of water, reflected in the results of the NCI.

'I do like being in nature and the flowers especially these daffodils, they've started growing a lot everywhere and it just brings a lot of colour to the space' ~ Rachel – 18-34 - Female

'I particularly like looking at the flowers and seeing what's in season' ~ Helen – 35-49 - Female

As interviews took place in Spring, when daffodils were in bloom at the sites where the NCI was completed, many participants mentioned their attraction and favourability to these flowers. Rachel particularly referenced the ability of flowers in 'bringing colour to a space' which is significant, as it closely aligns with the suggestion by Barber (2020), that females pick out specific features of a site, e.g., flowers in a greenspace, or SuDS techniques such as rain gardens. By mentioning how flowers bring a "lot of colour to the space" links closely back to the literature discussed in Chapter Two, section 2.2, as a greater focus is placed on how 'green' or colourful the space is, in comparison to the fact that there is vegetation (Taylor & Hochuli, 2017, p. 29). This further highlights the ambiguity of the term. With no mention of such specific attributes by male participants, females appeared to place more significance to them, resulting in females rating these features higher, resulting in a higher connectedness to nature. As participants were aware of the project relating to wellbeing prior to taking part, it is possible that male participants wanted to display an element of machismo, and portray themselves in a way which aligns with the sociocultural attitudes associated e.g., males presenting a level of superiority over women (Perez-Martinez *et al.*, 2021, p. 922). While there was no clear indication that male participants did not value the same elements e.g., the vegetation, as much as women, no male participant suggested otherwise.

Statement E 'I find nature to be really amazing' was rated highest by the 35-49 age group. The results closely algin with the expected outcomes found in NCI literature, with a suggestion that those below the age of 18 have a lower connection to nature due to situational factors such as developmental changes (Miles, 2019). Adolescence is typically a period of emotional development and self-identity, with the suggestion by Mueller & Flouri (2021), that greenspace may play a role in an adolescent's mental health and wellbeing (p. 1). While the specific elements in greenspace that influences this age group are unclear, it is suggested that interacting with an outdoor environment can result in higher levels of self-esteem and an improved mood (Mueller & Flouri, 2021, p. 2). It is expected that this age group do not use greenspace to the same extent, as the 35-49 age group, with potential fluctuation in the frequency they interact with the natural environment, there is likely to be a greater fluctuation in how 'amazing' individuals find nature to be, potentially explaining some of the variation of results in the 18-34 age group, particularly as this is a large age bracket (Miles, 2019). Greenspace can facilitate

the promotion of the recovery from stress, by allowing for an increased engagement with physical and social activities, it is possible that this may have some influence, particularly when considering the developmental and life changes that may occur within this demographic e.g., attending university, moving out of your family home (Mueller & Flouri, 2021, p. 5). Furthermore, it is important to highlight the phrasing of statement E, with individuals mentioning that they did not necessarily associate the term 'amazing' with each interaction they have with greenspace. Participants associated feelings of beauty and happiness with nature, but they did not find every part of nature to be equally as 'amazing'. This suggests that the question should be rephrased, to consider an individual's visual attraction to greenspace, or interest in the natural environment, and ensure that responses accurately reflect participants feelings towards greenspace. While Chapter Two, section 2.2 briefly considered the role of visual appearance, it is evident that this is something which must be considered in greater depth, particularly as participants value this (Larkin & Hystad, 2019, p. 448). Aesthetic value is highly regarded by individuals, and is largely recognised when considering the benefits greenspace, GI and SuDS can provide (Tribot *et al.*, 2018, p. 3). Therefore, as this is something participants favour, and value highly, it must be ensured that 'attractive' and aesthetically pleasing outdoor spaces are created, to encourage individuals to visit and interact with them (Zhang, *et al.,* 2023, p. 6).

There is also variation in the results recorded for statement F, 'I feel part of nature' which received the lowest scores. Both females and males rated this relatively low, with only one participant (Lucy) agreeing with the statement. While an explanation for a lower response to the statement could potentially be due to the past experiences of an individual in greenspace e.g., antisocial behaviour, it is clear that the phrasing of the question provided a greater issue for participants. Individuals commented on the fact that while they may have benefitted from interacting with greenspace, they did not explicitly feel as though they are physically part of the space. While individuals use greenspace as an outlet for physical exercise, social and recreational purposes, they do not necessarily feel a sense of belonging in greenspace. As the greenspaces considered when filling out the NCI were in urban areas of Leeds, it is possible that the location of the sites may of have an influence. Similar to statement E, statement F was considered difficult to answer, and was referred to as the most ambiguous and difficult question to answer by all participants. It is possible that instead of 'feeling part of nature', participants instead felt as though they interact with nature, and have a relationship with greenspace as they utilise it, however, this does not necessarily mean that they feel physically part of it (Nisbet *et al.,* 2020). Instead, individuals feel as though they have a relationship with nature, and humans interact and benefit from using outdoor spaces, however it should be reiterated within the NCI (Table 9) that individuals do not necessarily feel as though they are part of the natural environment (Nisbet *et al.,* 2020, Voukelatou *et al.,* 2020, p. 281).

The variation in responses, particularly those relating to statements E and F not only show how differently people interpret their relationship with nature, but also how the importance of the outdoor environment varies depending on multiple factors such as age and influences such as emotional attachments (Natural England, 2019). This closely links back to the points discussed above, particularly when considering how age influences the role of greenspace, however it is recognised by Sprague *et al.* (2022), that the impact of the natural environment on youths is not fully understood scientifically, which reiterates the importance of using measures such as the NCI (p. 662). While evident that age has influenced responses, it is clear that there is a wider issue with the NCI itself, with the phrasing of statements E and F resulting in individuals questioning what an ideal 'connectedness' to nature is. Due to the subjective nature of 'connectedness', it is difficult to determine scientifically how this is measured, as individuals are likely to interpret the term differently. While it is recognised that the NCI has allowed quantification of respondent's relationship and attitudes towards nature, it is evident that in order to be effective and truly representative of a population when used on a greater scale, the NCI must be adapted, to ensure it is clear and unambiguous when considering the phrasing used. While it is recognised that the NCI statements used will always be subjective and interpreted differently based on an individual's attitudes and emotions associated with nature, it is important to ensure accurate responses, statements are clear, as without this, it is possible that questions will be misunderstood (Miles, 2019). Participants did not necessarily consider every natural environment as 'amazing', however they did find a level of attraction and beauty in natural features such as vegetation and water bodies. This suggests that continued investigation of the level of connectedness to nature would be useful, to ensure that responses reflect participants relationship with greenspace. This would allow continued reviews of the role of greenspace, and an assessment of the elements of nature that individuals focus on most (e.g.,, females enjoying the presence of flowers and colourful vegetation) which can potentially inform future developments.

4.4.3 Greenspace as an 'escape'

The influence of the COVID-19 pandemic has also likely influenced the role of interacting with greenspace, therefore this needs to be explored in further detail. As a result of the restrictions enforced across the UK, it is estimated that almost two-thirds of individuals across the UK have a newfound appreciation of local greenspaces such as urban parks, and an increased desire to interact with outdoor spaces as a result (National Trust, 2023). With access to greenspace encouraging individuals to exercise, aiding physical health and improving feelings of wellbeing (e.g., feelings of happiness or satisfaction), this subsection will consider the role greenspace has in enabling individuals to restore and refresh themselves, and consider whether it is felt to be beneficial. Throughout all

interviews conducted, there was a common theme of both urban and rural greenspace in Leeds being considered as an 'escape', shown in the following quotes.

'Its quite a nice escape' ~ Rachel – 18-34 - Female

'Some people will only come out to like a park like this once a week so for them it is an escape from the day to day because it's doing something that you don't do five days a week' ~ Jessica – 18-34 - Female

'Its an escape really you know I find it quite difficult to sit still at home even though we've worked quite hard to make our garden you know a nice space as well there's always something that needs doing and I am one of those people that finds it difficult to sit down and do nothing at home' ~ Louise – 35-49 - Female

While an escape can have negative connotations, for example to succeed in avoiding a threat or dangerous situation, in this context, individuals are using the noun to describe being in a greenspace providing an element of freedom (Mazour, 2018, p. 5). Jessica and Louise state that greenspace can provide an area which is completely different to anywhere else, allowing individuals to remove themselves from situations that affect them negatively e.g., emotions or thoughts associated with work or a stressful environment (Dzhambov *et al.,* 2021, p. 3). This closely links with Kaplan's Attention Restoration Theory (ART), which suggests that spending time in nature, through sitting in a park, or gazing at surroundings can provide an opportunity to rest, reflect and restore (Ackerman, 2018). The theory is that nature and interacting with greenspace can contribute to overcoming mental fatigue, improving the ability to focus and direct attention more efficiently than an individual was capable of before (Ackerman, 2018). The ability to feel relaxed as a result of interacting with greenspace has been a clear theme throughout all of the interviews conducted, with the influence of the COVID-19 pandemic, and the subsequent lockdowns that occurred referenced as one of the main desires to visit greenspace (Dzhambov *et al.,* 2021, p. 2, Masterton *et al.,* 2020, p. 8). While there is a variation in how connected individuals feel to nature (subsection 4.4.2), it is evident that greenspace can provide a space to spend time in an environment that demands less of an individuals cognitive resources, which is crucial in urban areas (Ohly *et al.,* 2016, p. 305).

When considering the rise in remote learning and increased work from home schemes that have been introduced since the beginning of the COVID-19 pandemic, it has been increasingly difficulty for individuals to balance work and personal life in the same environment (Masterton *et al.,* 2020, p.15). Between December 2019 and March 2022, working from home across the UK increased from 4.7

million to 9.9 million, more than doubling (Office for National Statistics, 2021b). The sense of greenspace as an escape throughout the COVID-19 pandemic is illustrated in participant's quotes:

'Greenspace was a good change of scenery during COVID, its an escape' ~ Matthew – 18-34 - Male

Matthew referencing greenspace as 'a change of scenery' is therefore significant, particularly if an individual spends most of their time in the same environment, such as working in the same place, which is likely to have occurred during the pandemic. As more people are working from home, there are increased opportunities for people to interact with local greenspace with the Office for National Statistics (ONS) highlighting how national lockdowns have changed people's relationship with nature, by encouraging individuals to interact with greenspace more frequently (Office for National Statistics, 2021a). With greenspace being the only place individuals could visit outside of their homes during lockdown, the ONS suggest that individuals have interacted with 'familiar surroundings' e.g., greenspace, in new ways, for example by encouraging people to go out on walks during their lunch breaks and be in the fresh air after they have finished work or education (Office for National Statistics, 2021c). It is evident that while individuals could not travel far, and therefore visit different areas, even by having small-scale SuDS schemes e.g., rainwater gardens or bioretention ponds in residential areas is preferred, as more beneficial than not incorporating green solutions at all (Da Silva & Souza, 2019, p. 2).

Accessibility to urban greenspace in Leeds has not only ensured that individuals can regularly interact with the outdoor environment, but also allowed for an improved physical and mental state, benefiting those who interact. The ability that nature has to improve mental wellbeing and provide this 'escape' in Leeds is increasingly recognised by individuals, which is clear throughout the interviews:

'*Whenever I am stressed it just helps calm like it just adds a calmness to you and I think you just have time to think things over and clear your mind'* ~ Rachel – 18-34 - Female

'*It's quite calming getting back to nature I'm quite a stress head sometimes so actually coming back to nature and just like I think it helps me slow down and just sort of appreciate that actually whatever's happening'* ~ Jessica – 18-34 – Female

'Its sort of like meditation type time but it's where you're not really focusing on anything in particular you just being mindful focusing on the now' ~ Steve – 50-64 - Male

These responses further support the principles of ART, particularly when considering the quotes from Rachel and Jessica, who both reference the mental fatigue and anxiety they feel. By removing themselves from a stressful or uncomfortable situation by accessing greenspace, respondents felt they were able to control their negative emotions and feelings. By instead placing focus on the natural

environment, listening, and watching specific features of a greenspace e.g., trees, flowers, or birdsong, individuals have been able to gain an element of 'calmness', improving their mental wellbeing (Barton & Rogerson, 2017, p. 80). While the extent of the influence of COVID-19 on mental and physical health is still emerging, it is evident that greenspace has provided an outlet to improve and maintain quality of life and wellbeing during lockdown periods, providing the 'escape' that participants mention. The ability greenspace has in achieving this is of particular significance, as it highlights the role that outdoor spaces can have in restoring and improving people's thoughts and feelings, positively influencing mental wellbeing (Ohrnberger, 2017, p. 46). Interacting with the natural environment has therefore led to a newfound appreciation of greenspace, with outdoor environments providing an escape from day-to-day stressors. COVID-19 has therefore affected individuals' perceptions towards greenspace, and the frequency in which they use them post-lockdown :

'*I think that greenspace was one of the lifelines throughout lockdown'* ~ Matthew – 18-34 - Male

'I think we use it more now to be honest because I think as soon as somebody says to you that you have to do something like you have to stop in everyone rebels and says well no I'm going out' ~ Lucy – 35-49 - Female

'This is how I kept in touch with my friends and felt like I had some sort of connection with them and yes you can have texts yes you can have phone calls but it doesn't beat seeing somebody' ~ Helen – 35-49- Female

'I think it's probably made me appreciate them more because this is obviously right on my doorstep, and I think there was a tendency to sometimes just overlook it and just forget it was there' ~ Louise – 35-49 - Female

Participants thus had a greater appreciation for greenspace because of COVID-19 lockdowns, closely aligning with the data published by the ONS (Office for National Statistics, 2021c). The results show that participants have a sense of admiration for greenspace, referencing the fact that it allowed people to interact face-to-face (Helen) and have time to connect with individuals outside of their household. Utilising greenspace during this period has allowed reflection and restoration in the natural environment, while continuing to provide an 'escape' and element of freedom outside the home environment (Dzhambov *et al.,* 2021, p. 3, Wang *et al.*, 2019, p. 2). These responses also align closely with the literature, where spending time in, or being active in greenspace can improve feelings of happiness and contentment, by using it as an area to socialise and exercise. The pandemic has provided a new way for the general public to value urban greenspace, acknowledging the important role the natural environment can play in improving and maintaining mental and physical health

(Kleinschroth & Kowarik, 2020, p. 318). It is possible that COVID-19 has reshaped the general public's attitudes towards greenspace, encouraging a greater interaction to promote physical and psychological wellbeing (Kleinschroth & Kowarik, 2020, p. 320).

4.5 Conclusion

Chapter Four has not only highlighted the crucial role greenspace can play in providing a benefit to mental and physical wellbeing (subsection 4.4.3), but also reiterated the potential urban greenspace has in creating a multifunctional space (O'Donnell, 2021, p. 1). A descriptive analysis of the online questionnaire and interview responses in section 4.2, has reiterated the number of interpretations associated with greenspace, with individuals commonly associating greenspace to be vegetated, open areas, such as parks or fields. While respondents have placed a greater emphasis on the role of parks, closely aligning with the literature, the mention of areas such as farmland and beaches suggests that individuals focus on the space itself, regardless of whether it is presented as 'blue' or 'green'. Through analysing the different interpretations of greenspace provided, and comparing the results alongside the views of academics, policy makers and NGOs, it is evident that the study of greenspace is multidisciplinary, with a need for a collaborative approach between those developing and encouraging the use of outdoor areas, and the general public who utilise the space (Taylor & Hochuli, 2017, p. 27). Ensuring a collaborative approach between policy makers, academics and the general public will not only allow for clarity surrounding whether an area is classified as a greenspace, but provide a greater sense of power from lay communities and populations who utilise a greenspace, as individuals may feel as though their cultural values and requirements for a greenspace are provided (Van der Jagt *et al.*, 2019, p. 758). To guarantee that a collaborative approach can be achieved, a set of provisional descriptors were outlined in subsection 4.2.1 to allow each sector identified greenspace the same way, allowing a clear understanding of the term.

Both the questionnaire and interview responses highlight that greenspace is predominantly used for physical exercise and socialising, with reference to the ability an outdoor space has in creating a multifunctional space. Participants also mentioned the purpose of a greenspace changing depending on age, gender, occupation and stage in life (Sprague *et al.*¸2022, p. 668). It has been suggested that alongside physical activity, greenspace is able to provide an opportunity to take part in mindfulness exercises, by walking around a space. The ability nature has in allowing individuals to relax and restore themselves reiterates the importance of urban greenspace, evoking positive emotions and feelings. A recognition of the multifunctionality of a greenspace has also been significant, with it crucial that where a greenspace exists, it has the potential to enhance and benefit the surrounding community (Wade & McLean, 2014, p. 320). While it was suggested that every greenspace is not required to provide a function, it is clear that individuals utilise greenspace in Leeds for similar purposes.

Greenspace can provide multiple benefits, which participants associate as being mental, physical, economic and environmental gains. Once again, the ability greenspace has in providing a

multifunctional space has been reiterated here, with participants recognising that multiple benefits can be provided at once (Hansen *et al.,* 2019, p. 103, Wade & McLean, 2014, p. 320). It is clear that outdoor space, whether it is being provided in the form of GI, greenspace or SuDS can provide social, recreational and environment benefits to individuals and nature (Browning *et al.,* 2022, p. 8). An emphasis has been placed on the ability greenspace has in benefitting both physical and mental wellbeing, providing an opportunity for individuals to rest, reflect and relax while undertaking physical exercise in a space (Joye & Dewitte, 2019, p. 4). By identifying the range of benefits a greenspace can provide, objective three of the research project has been achieved. The multiple benefits provided by greenspace not only reiterate the high value individuals associate with outdoor space in Leeds, but also the role greenspace can have in providing a form of health intervention, through techniques such as ART, which allow an individual to use the natural environment to relax, reflect and restore (Ackerman, 2018). The principles of ART closely align with a common theme of greenspace providing an 'escape' from Leeds city centre, which was considered by all interview participants. Providing an escape was closely linked with the COVID-19 pandemic, and the lockdown restrictions that were enforced, which encouraged participants to interact with greenspace more frequently (Li *et al.,* 2020, p. 2).

A level of ambiguity surrounding the definitions of "greenspace" and "wellbeing" will always however remain, as both terms are subjective, dependent on an individuals lived experience, and attitudes towards greenspace. It is evident that greenspace cannot be identified to one singular definition, and instead can be acknowledged using a set of descriptors to determine the type of space being considered. This view is like those surrounding "wellbeing", however it is clear that a greenspace can provide multiple function's e.g., social, environmental and recreational benefits, which in turn benefit an individual's mental and physical health (Zuniga-Teran & Gerlak, 2019, p. 3). To encourage and continue to develop greenspace, further research must be undertaken, to allow for a collaborative approach between policy makers and communities that interact with greenspace.

5.0 Project Conclusion

As cities begin to adapt their approaches to urban flood risk in response to climate change, and the necessity for accessible greenspace, it is clear that greenspace is vital in providing an area which can provide multiple benefits and functions (O'Donnell, 2021, p. 1). With this in mind, the research project has allowed for the initial steps in investigating the role of greenspace across Leeds achieving the project's aim and objectives, by examining the influence interacting with the natural environment has on wellbeing.

5.1 Project Aim: To Investigate how Greenspace in Leeds Influences Wellbeing

The Literature Review (Chapter 2) highlighted the clear gap, addressed by the project aim of exploring the role of greenspace in relation to wellbeing. This study has shown clear uncertainty surrounding clearly defining greenspace, GI and SuDS, which has led to multiple interpretations of the terms, despite the solutions closely interlinking (Taylor & Hochuli, 2017, p. 26). It is evident that throughout, participants place an emphasis on parks, largely due to this being the area of greenspace closest to them, however it is important to consider how SuDS and GI fit into this and can be incorporated. While developing large-scale greenspace in densely populated areas is challenging, where space allows it is important to incorporate solutions on a small-scale, whether that be through retrofitting areas SuDS devices e.g., green roofs, tree planting in residential areas (Green, 2019). While these solutions do not provide the same 'level' of benefit to individuals, this design is not only placing the environment at the forefront, but creating a liveable, more sustainable urban landscape (Stovin & Ashley, 2019, p. 410).

The literature review shaped the nature of the research design (Chapter Three, section 3.2), with a mixed-method approach used throughout, further ensuring that the thesis aim was achieved. It is evident throughout the qualitative methods used that greenspace provides a benefit to those who interact with a space, suggesting that alongside an increased engagement with the public (Chapter Five, section 5.2), the importance of greenspace will continue to be recognised (Brears, 2018). The research methodology (Chapter Three) has ensured that the importance of greenspace in an urban area has been reiterated.

The results discussed in Chapter Four, section 4.2, reiterate the number of interpretations associated with greenspace, with an emphasis placed on the importance of a greenspace

being ‘undisturbed’ by developments such as offices and residential areas. Investigating this has allowed for a table of descriptors to be formed, which provide a structure to allow for greenspace to be identified. If as mentioned in chapter five, subsection 4.2.1, a multidisciplinary collaborative approach is undertaken by policy makers, NGOs and academics, it will ensure that greenspace is designated and developed effectively, providing a multifunctional space that enhances and benefits a community (Wade & McLean, 2014, p. 320).

5.1.1 Objective 1: To Assess how Individuals Define Greenspace

Placing a focus on defining greenspace has also ensured that objective one of the study has been achieved, by identifying how individuals interpret the term. It is evident that the majority of individuals consider a greenspace to be an open, vegetated urban area, however there has been some acknowledgement of the presence of rural greenspace, and the desire to visit areas outside of the city centre.

Achieving objective one has ensured that the research project could then begin to investigate the link to the purpose of greenspace and the influence the outdoor environment may have on an individual’s mental and physical health and wellbeing. Understanding how the general public define “greenspace” has been key in considering how individuals interact with a space, with attitudes towards the outdoor environment shaping participants feelings towards nature.

5.1.2 Objective 2: To Investigate if an Individual’s Understanding of Greenspace Influences How it is Used

By investigating how a greenspace is utilised, it has guaranteed that objective two of the study has been met, with questionnaire and interview responses outlining that greenspace is predominantly used for physical exercise and socialising. Once again the role of a multifunctional space was mentioned throughout Chapter Four, section 4.3, with a clear desirability by participants to have access to a space that enables multiple activities and benefits. In contrast, it is evident that not all greenspace requires the same purpose (Chapter Four, subsection 4.3.1). While greenspace can always provide an ecological and environmental benefit by incorporating vegetation, it was recognised that there is not always a requirement for a function. It is clear that while participants value a multifunctional area, smaller areas of greenspace e.g., patches of grass, are not expected to provide these. Examining this has

further supported the project outcomes, achieving objective two of the thesis, by outlining the purpose of greenspace in Leeds.

5.1.3 Objective 3: To Identify the Benefits that Greenspace Can Provide

Investigating the definition and purpose of a greenspace has allowed for a thorough analysis of the role of wellbeing, and the additional benefits associated with interacting with a greenspace resulting in Objective 3 being achieved. As evident in Chapter Two, section 2.6, wellbeing is considered as a mental and physical state, which can provide an element of calmness and the ability to improve an individual's quality of life. This closely aligns with the literature, with a suggestion that an improved physical wellbeing can improve mental state. Throughout, there has been positive feelings associated with interacting with a greenspace, with every interview participant highlighting the ability Temple Newsam and Roundhay Park had in allowing them to 'escape' day-to-day stressors such as work, particularly as a result of COVID-19. The role of the COVID-19 pandemic has reiterated the importance of greenspace, suggesting that individuals value outdoor space more, as a result of the travel restrictions implemented during the various UK lockdown restrictions (National Trust, 2023). While the true extent of the effects of COVID-19 on mental and physical health are still emerging, it is evident that participants have a newfound sense of admiration for greenspace.

5.2 Project Limitations

Throughout the project, it was acknowledged that there were some limitations to the research being undertaken, and while most issues were able to be overcome, it is important to address the restrictions. While it would have been beneficial to compare a number of cities across the UK, as opposed to focusing on one area, it was recognised that this was unrealistic with the timescale provided, as it would have been difficult to travel, collect and analyse data from multiple places within efficiently. While a focus throughout the study remained on Leeds, it allowed for a larger dataset to be collected, with multiple interview dates arranged at Temple Newsam and Roundhay Park, to ensure the highest response rate. It is unlikely that this would have been possible to conduct if multiple cities were used, as there would not be sufficient time to travel to each location numerous times.

While focusing the research project in Leeds, it was recognised that the research project is not fully representative of the entire population's attitudes towards greenspace and wellbeing,

however, this issue was addressed by creating an online questionnaire which allowed for greater geographical reach. Not only did this increase the validity of the project, ensuring a higher response rate, but the use of an online questionnaire proved useful for those who wanted to take part in an interview, but were not available or did not live near the study sites. Furthermore focusing on Leeds allowed for the project to provide a basis for future study opportunities, by examining the role of greenspace and the multiple benefits that individual can gain, as outlined in subsection 5.3.

It was recognised that the main limitation of the project was surrounding the personal nature of wellbeing, as it was acknowledged prior to undertaking any form of data collection, that some individuals may not feel comfortable responding. To ensure participants felt comfortable when discussing their mental and physical wellbeing, the nature of the study was outlined prior to providing consent to the online questionnaire and interview. This guaranteed that every participant was aware of the topics being discussed. Alongside this, it was ensured that every question (excluding those regarding consent) remained optional, so that participants did not feel pressured to answer if they did not wish to. Using the NCI further allowed for the questions relating to wellbeing to be clearly outlined to participants (Chapter Three, section 3.5), however this did remain optional.

5.3 Future Research Considerations

It is evident that while there will always be an element of ambiguity associated with defining "greenspace" and "wellbeing", individuals value interacting with the natural environment, with physical exercise and social interactions allowing for an improved health and quality of life (Hansen *et al,* 2019, p. 105). While successful, the research project has clearly outlined the variation in definitions of greenspace, the purpose of the natural environment and the influence this has had on individuals wellbeing in urban areas across Leeds, there are still multiple areas which must be explored further. Greenspace is considered vital in ensuring urban communities have access to outdoor space, and without a collaborative approach between policy makers and those who interact with greenspace, a greater recognition of the extent of benefits a greenspace can provide is unlikely (Van der Jagt *et al.*, 2019, p. 758).

It is evident throughout chapter five that despite a low response rate, participants generally feel a connection to nature, and have a desire to interact with the natural environment. A

further study considering the NCI on a larger scale is necessary for a more accurate representation of the adult lay population, however, this method has allowed the project to undertake an initial investigation of the role of nature connectedness in urban areas. Comparing multiple medium-sized cities would have been beneficial, and while this was not achieved throughout this particular project, it is an area which could be developed in the future. A comparative study which examines the role of urban greenspace in similar sized cities including Leicester and Newcastle could be undertaken, with the same online questionnaire, interview outline and NCI used, to investigate whether every urban greenspace provides the same benefits and purpose. In achieving this, it would not only allow for a comparison with the results gathered throughout this project, but also a consideration of the link to larger cities, and whether greenspace benefits remain similar.

It is evident that public engagement and awareness are key to encouraging uptake of greenspace and green solutions, therefore there must be a greater investigation into the role of public education, and the influence this can have on individual's attitudes towards greenspace. While the extent of the role of public education was only briefly considered in Chapter Four, it is clear that future research must consider the crucial role greenspace can play not only from a flood management perspective, but also in supporting health and wellbeing (Mell, 2017, p. 137). While participants that took part in the study recognised the benefits of interacting with greenspace, most were only aware once the benefits were explained to them.

With an emerging interest into the impact a greenspace has on life in urban areas, communication and public awareness are crucial in encouraging individuals to interact and must be implemented to ensure a continued funding and development (O'Donnell, 2021, p. 1, Taylor & Hochuli, 2017, p. 27). Without a greater investigation into how to successfully promote the use of a greenspace, negative attitudes towards funding and interacting with greenspace with continue, as individuals do not want to fund a project they do not perceive to be directly beneficial to themselves (Taylor & Hochuli, 2017, p. 26). Promoting the benefits of using greenspace may be achieved by considering how individuals perceive greenspace prior to taking part in an educational workshops or focus group, to compare if an individual's attitudes towards the natural environment has changed, after this. In exploring this, not only will it encourage a non-technical audience like the general public to potentially interact with

greenspace more frequently, but it will provide developers, and policy makers with an insight into public attitudes towards outdoor space, and identify features e.g., vegetation, public amenities that individuals find most beneficial in a greenspace. Ensuring a greater public engagement is crucial, particularly when considering the necessity for a collaborative approach to implementing outdoor space, as outlined in Chapter Five, section 4.2.

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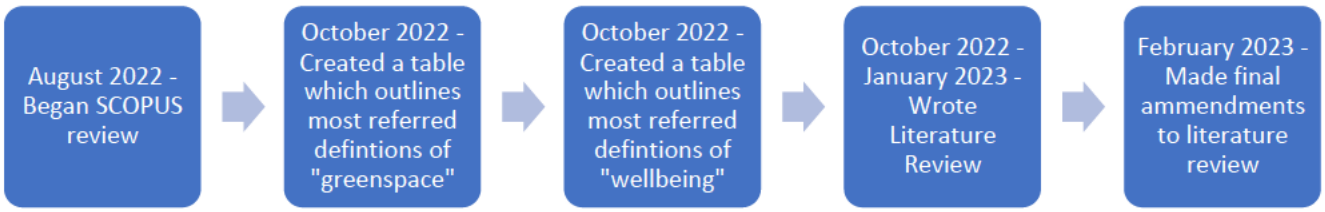
7.0 Appendices

7.1 **Appendix A** – Timeline of Dates and Activities



7.1.1 **Appendix A** - Parks and Greenspaces Strategy Location List

1. Temple Newsam
2. Roundhay Park
3. Chevin Forest Park
4. Golden Acre Park
5. Kirkstall Abbey
6. Middleton Park
7. Lotherton Hall

7.2 **Appendix B** - LQP Values

Leeds Quality Park Criteria

When judging a park, it must be given a score of 0 – 10 on the 26 criteria listed below.

0 1	2 3 4	5 6	7	8	9	10
Very Poor	**Poor**	**Fair**	**Good**	**Very Good**	**Excellent**	**Exceptional**

Criteria	Category
A Welcoming Place	**1** Welcoming
	2 Good and safe access
	3 Signage
	4 Equal access for all
Healthy, Safe and Secure	**5** Appropriate provision of quality facilities and activities
	6 Safe equipment and facilities
	7 Personal security
	8 Control of dogs/ dog fouling
Well Maintained and Clean	**9** Litter and waste management
	10 Horticultural maintenance
	11 Aboricultural and woodland maintenance
	12 Building and infrastructure maintenance
	13 Equipment maintenance
Environmental Management	**14** Managing environmental impact
	15 Waste minimisation
	16 Chemical use
	17 Peat use
	18 Climate change adaption strategies
Biodiversity, Landscape and Heritage	**19** Management of natural features, wild fauna and flora
	20 Conservation of landscape features
	21 Conservation of buildings and structures
Community Involvement	**22** Community involvement in management & development
	23 Appropriate provision for the community
Marketing	**24** Marketing and promotion
	25 Appropriate information channels
	26 Appropriate educational and interpretational information

7.3 **Appendix C**. Pictures of Temple Newsam and Roundhay Park

Temple Newsam

From pHimages (2014a)

This item has been removed due to 3rd Party Copyright. The unabridged version of the thesis can be found in the Lanchester Library, Coventry University.

Roundhay Park

From The Times (2020)

From British Cycling (2017)

From pHimages (2014b)

7.4 **Appendix D.** Online Questionnaire Template

Greenspace and Wellbeing

0% complete

Privacy Notice

The purpose of the research is to investigate if greenspace availability influences wellbeing, and consider how participants define and utilise greenspace.

The research project is being conducted by Emily Amini at Coventry University. You have decided to take part in this questionnaire survey because you have expressed an interest in the project.

Your participation in the survey is entirely voluntary, and you can opt out at any stage by closing and exiting the browser. You may withdraw at any point during the questionnaire by clicking on the X at the top right of the screen. All answers completed until that point will not be saved.

If you are happy to take part, please answer the following questions relating to greenspace and mental and physical wellbeing. Your answers will help us to understand how individual's utilise greenspaces. The survey should take approximately 10 minutes to complete.

Your answers will be treated confidentially and the information you provide will be kept anonymous in any research outputs/publications. Your data will be held securely online on Jisc Online Surveys which stores its data using Amazon Web Services. All data will be deleted by 30/03/24.

I have read and understood the above information. ✱ *Required*

- ○ Yes
- ○ No

I understand that, because my answers will be fully anonymised, it will not be possible to withdraw them from the research once I have completed the survey. ✱ *Required*

- ○ Yes
- ○ No

I confirm that I am aged 18 or over. ✱ *Required*

- ○ Yes
- ○ No

I give consent to take part in this questionnaire survey. ✱ *Required*

- ○ Yes
- ○ No

Introduction

First, some questions about you.

1. How old are you?

- ○ 18-34
- ○ 35-49
- ○ 50-64
- ○ 65+

2. How do you identify?

- ○ Female
- ○ Male
- ○ Non-binary
- ○ Other
- ○ Prefer not to say

Greenspace

3. How would you define greenspace?

4. Which of the following do you consider to be a greenspace? Tick all that apply.

- [ ] Public Parks
- [ ] A vegetated area
- [ ] Playing fields
- [ ] Allotments
- [ ] Private Garden (e.g. located at a residential home)
- [ ] Public Garden
- [ ] Golf Course
- [ ] Other

4a. If you selected other, please elaborate below.

5. Do you use greenspace?

- ( ) Yes
- ( ) No

6. If yes, why? e.g. for physical activity, socialising

6. If no, why? e.g. poor access to greenspace, safety

7. On average, how many hours per week do you spend in greenspace?

- ○ 0 Hours
- ○ 1-3 Hours
- ○ 4-6 Hours
- ○ 7-9 Hours
- ○ 10+ Hours

Example

8. Do you consider this site to be a greenspace?  See the source image Additional Information: Site is located in Sheffield city centre.

- ○ Yes
- ○ No

9. Please explain your answer to question 8.

10. Is there anything you like/dislike about this site?

Example

11. Do you consider this site to be a greenspace?

Additional Information: The site is located in Leeds.

- ○ Yes
- ○ No

12. Please explain your answer to question 11.

13. Is there anything you like/dislike about this site?

Example

14. Do you consider this site to be a greenspace?

Additional Information: The site is located in Cheltenam

- ○ Yes
- ○ No

15. Please explain your answer to question 14.

16. Is there anything you like/dislike about this site?

Greenspace Examples

17. Do you live near any sites similar to the three shown?

- ○ Yes
- ○ No

Greenspace Barriers

18. Do you think there are any barriers to using greenspaces?

Wellbeing

The sites you have been shown in the previous questions incorporated solutions which help to reduce flooding. This includes the use of Sustainable Drainage Systems (SuDS) which are a natural approach to reducing the risk of flooding, while also allowing for recreational and social benefits.

19. Have you ever used greenspace to improve your physical health?

- ○ Yes
- ○ No

20. Have you ever used greenspace to improve your mental health?

- ○ Yes
- ○ No

Greenspace Features

21. Are there any specific features within a greenspace that you find beneficial? e.g. walking routes, eating and drinking facilities, areas to play sport

Greenspace Interviews

22. Would you be interested in taking part in an interview exploring the relationship between SuDS, greenspace and wellbeing in more depth? I am hoping to conduct these in Leeds at the provisional sites listed below: Temple Newsam, Roundhay Park, Hyde Park and RSPB St Aidans. If so, please leave your email address in the box below and I will get back to you - your help would be greatly appreciated!

Final Comments

23. Thank you for taking the time to complete the questionnaire, it is greatly appreciated. Do you have any additional comments that you feel would benefit the project?

For SurveyCircle users (www.surveycircle.com): The Survey Code is: KN5M-GTN8-NRPF-R8TN

7.5. **Appendix E.** Interview Questions

1. How did you find out about the site?
2. What do you think about how the site looks
3. If we were to use a rating scale for this space (Temple Newsam OR Roundhay Park) how do you think you might rank the following phrases?
    a. How does the site make you feel
4. Is there anything you like/dislike about the site?
5. Do you use the site for any specific purpose e.g. walking, exercise, socialising
        i. Do you ever use any facilities (e.g. café) at the site If so, why Why not?
    b. Do you know what Sustainable Drainage Systems (SuDS) are If the participant answers 'no', a brief explanation will be provided.
6. Why do you chose to visit this site over other greenspaces?
    a. How does it compare to other greenspaces
    b. Is it similar/different?
    c. Does it have the same purpose
7. Would you recommend this site to other people
8. Have you ever used this site (or a similar area) to improve your physical wellbeing
9. Have you ever used this site (or a similar area) to improve your mental wellbeing
    a. What does the term wellbeing mean to you
10. Can you think of any other benefits (aside from wellbeing) that this site could provide?
11. Are there any additional comments you would like to add that might benefit the project

7.6. **Appendix F.** Certificate of Ethical Approval

Certificate of Ethical Approval

Applicant:	Emily Amini
Project Title:	An Investigation into the Relationship Between Greenspace Availability and Wellbeing in Leeds

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:	25 Jan 2023
Project Reference Number:	P143204

7.7 **Appendix .** Interview Transcripts

Key

(x)	Pause
{}	Interruption
(!)	Emphasis
[]	Added words for context e.g. location name

PN1 Transcript – Online (12/4/23)

INT: To begin with I thought we could talk a bit about greenspaces and what they are (2) I'm quite interested to hear about what you think greenspace is and we have this whole idea of greenspaces providing something to both people and also the natural environment in the sense that they can provide a form of flood management (2) particularly from a flood management point of view (1) as we will get into the human and social side in a moment (1) is this something you have ever thought about?

PN1: I suppose it is something I am aware of in the sense that I know that parks and places like that could hold flood water but I don't think about it all that often

INT: That makes sense (!) you are right in parks being able to do that too and I suppose to you (1) what is greenspace? If someone asked you to define it or asked you what you thought it greenspace could be how would you explain it to them?

PN1: Well before I did your survey (1) I would of probably said that its things like parks and longer green walkways things like that

INT: Yeah

PN1: Woodlands that you can get access too (1) all those kind of things

INT: Yeah

PN1: Having had a look at that the survey [the list of different types of greenspaces provided in the survey completed prior to the interview] I'm now stuck with how I would define a greenspace because I think there was a couple of examples there where you had a fairly wide tarmac path but it had a little bit of greenery down the sides of it and it was in the middle of town [Leeds] and (3) I would struggle as to whether that now whether or not I would class that as greenspace (1) I think (2) I probably would (2) but I wouldn't be classing if that was all that was around me I wouldn't consider that area to be somewhere that had greenspace but I think as part as a overall (2) bigger thing you could say that those paths you know that have been specifically designed to be (2) mutli-people a bit quieter and greener they would form part of that overall greenspace plan

INT: Yeah (1) I think its an interesting one because (2) there is so many different ways you can look at greenspace

PN1: Yeah it is like there was an example [on questionnaire] that didn't even look like gardens it was just grass at the back of the flats that went onto the canal and there's a path down it (2) but yeah that's that would be greenspace (1) you know as long as there aren't too many fences up (2) I'm not sure how big a garden or how private a garden would need to be to be classed as a greenspace (1) now I look at my garden (1) its definitely a greenspace (1) I plant some flowers and wildflowers for the bees (1) I get cats in there (2) you know it's a pleasant place to (1) and its fairly quiet despite being on a modern estate so I would class that as a greenspace too but its probably not something I would of necessarily thought of before [the questionnaire] because its not (1) well I don't want to say its not particularly green because there's a lawn in it (2) its not particularly "naturery"

INT: Yeah

PN1: If that makes sense you know there's not much in the way of flowers and (2) other wildlife you know there's cats and the few occasional birds

INT: Yeah and with that in mind and I know it was somewhat briefly mentioned before but (2) how would you say that greenspace makes you feel? Is it (2) somewhere that makes you feel good or bad or another emotion?

PN1: Yeah I don't have anything (2) negative to say about greenspaces in general (2) sometimes its negative there is some negativity there because some people will dump rubbish and you'll get groups of arseholes going around just being a bit of a pain (2) but that's a people problem (2) more than a greenspace problem you know its (2) it tends to be a concentrated problem

INT: Yeah

PN1: I (2) would say that usually if they're [greenspace] having any effect on me it would be positive you know if I'm there its usually going to be some nice sunny weather and you're just trying to clear your mind and you're enjoying the sun on your neck and (2) you're waving and saying hello to people in the narrowboats going down the canal or (2) you're stopping to talking to the little kid who is so excited that they've caught a dragonfly or stuff like that other times it might be if I'm out and I go out quite often actually when it rains particularly when it rains quite bad because a lot of people disappear and then the area is quieter and you can (3) you can let your mind wander and just (2) and just have that sort of quiet (1) I don't want to call it meditation type time but it's where you're not really focusing on anything in particular you just being mindful focusing on the now (3) so yeah it is a generally a positive thing (2) I think definitely (1) although I don't use a lot of greenspaces as much as I would like too (1) just motivation (1) I can't (1) I haven't actually been outside the house for a few days now except to put the bin out so going out for a walk somewhere green is not a priority

INT: Yeah

PN1: But it is an important thing for me to have access too (2) yeah in a variety of (3) of activities (1) I used to run a lot so I would choose areas where even if you running fairly close to a road you know its got a bit of landscaping at one side of the path to the warehouses and a bit more at the side of the road and there's a hardcore path that's you know that's (2) that's more out in nature (1) I used to do a lot of park runs (1) you know I was at park runs every Saturday morning enjoying my little run round there (2) more recently I've taken too (4) to playing air soft you know that gets me out and in greenspaces and doing some target shooting with air rifles

INT: Yeah and I suppose for a lot of people greenspace is not necessarily somewhere we all think to visit for many different reasons (2) and I think as well I know we have briefly touched on it but I think its interesting to see all the different functions these greenspaces have for you (2) you know you can use it for lots of activities and socialising or being on your own and then there's that flood management side of it which I'm not sure if you are aware of too which I wondered if it was something else you had ever thought about

PN1: Yeah I mean I have thought about it being some sort of buffer really I suppose if there's lots of vegetation and things like this that must be a good thing for the environment?

INT: Yeah exactly that (1) so yeah tree planting or having ponds or depressions in the land can do all those things to slow down flood water going into urban areas (1) they are called sustainable drainage systems or SuDS

PN1: That makes sense, I didn't know they were called that

INT: Yeah there's lots of different methods that can be used (1) I know you mentioned about multiple greenspaces before and that is sometimes referred to a green infrastructure as its almost a network of greenspaces if that makes sense

PN1: Yeah that's quite interesting to know (1) I think I do notice when I'm out and about you will see little ponds or areas where flood water can gather if that makes sense (1) you know as well to see that kind of natural flood element of a greenspace is interesting to compare against you know I see people you know they might be dog walkers who meet up in greenspaces and have a chat and there's plenty of it feels wrong saying old people now as I'm rapidly approaching that point but you'll see older people who'll be (1) you know they've got their free time they've gone out for a walk (1) they've got a spot where they stop because there's a good chance that they'll bump into you know another couple or someone that they know and have a chat (1) you know as well its interesting that there's that going on and then there's so much more too you know there's all the wildlife and the birds you can hear and then like you said that flood defence element of it as well

INT: Yeah and I think that sometimes it can be as simple as it is like you said someone hearing the birds or it might be the fresh air or seeing vegetation like you said it can be anything that gives people (2) that (1) those feelings [in a greenspace] and I know you said the weather you know if its raining it makes you want go to these places more (1) is there anything like certain seasons that have any influence or is it just down to how you feel on the day?

PN1: Yeah it is usually how I would feel on the day (2) when I used to do a lot of running (1) it was nice to go out and feel the sun (1) even though you know hot sunny weather is not ideal for going and doing a blazing run but it is nicer to do something like that where there is a bit of shade and it's a bit cool and you have all the trees and water (3) I think all things being equal I would prefer to be out when its warm and sunny (2) I am probably not alone in saying that but I also (2) I don't like places that are really busy and crowded (1) I would hate to think that one of those green parks in London was the only place I had to get some greenery (2) I just couldn't be bothered with that

INT: It can almost be overwhelming as such?

PN1: Yeah I mean it is nice to go for a walk with a friend certainly during some of the COVID times when things opened up a bit and we could actually meet people again I was going for a walk with a friend and it would be (1) out in the relatively local countryside (1) we ended up walking round some paths round the local (1) bird centre then over the farm fields and things like that that have got pathways in and you didn't have a lot of people out there but you could just have a nice little chat with someone (2) in a nice (1) a nice environment I think (1) all those things come together and its nice and relaxing you know its pleasant its enjoyable

INT: Yeah (1) its really interesting to hear everyone's thoughts on these things and see how you think about these things and I suppose with that in mind do you think that there are any additional benefits to greenspace? Is it purely for people or nature in the sense that we are promoting the use of it? What are your thoughts?

PN1: Yeah I mean there obviously not just for people but (2) without people getting some benefit from them [greenspace] they are not interested in preserving the greenspace (1) you know let them build a car park on it or another Amazon warehouse or a housing estate (1) you need some public interest to keep these spaces open (2) I think anywhere that you can provide habitats nature will automatically take advantage (1) I'm sure all of the various birds at the bird sanctuary you know Fairburn Ings (1) its not far away (1) I'm sure they didn't buy them at pet shops and ship them in you know there's water there (1) there's trees you know the insects come the birds come the predator

birds come (2) yeah and I and I do (2) as I said I keep part of my garden wild specifically for wildlife (1) and that's not just because I love bumblebees and I want them to have somewhere you know free of pesticides! My local cats love coming to my garden too as there's long grass for them to hide in and (3) that kind of thing so they [the animals] benefit from it a lot more than I do you know they're out in it everyday enjoying nature but yeah I think anything that can promote nature

INT: Yeah that makes sense (2) do you think there are any downsides to these spaces?

PN1: I think its important when kids are a bit younger and they can get interested in things that will stick with them for life (2) to promote the importance of nature (2) so even little model farms where they can see some of the animals and greenery and vegetation and get a bit more of an idea that life isn't just idiot kids on the corner being antisocial and smoking weed (2) I think that sort of behaviour is the negative part of greenspaces because instead you could be getting out there and (4) see that there is something more out and about even if its splashing in the puddles or starting to see insects and birds (3) and starting to make daisy chains with them or things like that you know (2) that gets a bit in touch with nature which tends to get lost a bit and get away from that negative social behaviour too

INT: Yeah I understand where you are coming from (2) it sounds like awareness and education are important?

PN1: Yeah most definitely (1) I agree

PN2 Transcript – Temple Newsam (2/4/23)

INT: I have started the recording now

PN2: OK

INT: Just to confirm with you (1) is that route [points at map that is being shown to participant] OK?

PN2: Yeah its fine

INT: Great (1) We will start walking round then and have a bit of a chat

PN2: Yeah

INT: Like I said before the recording started (2) I just want to know a bit more about how you use greenspace and your thoughts about it (1) I thought a good place to start (1) the first thing (1) if someone asked you to define it what would you say greenspace is?

PN2: I think somewhere like a park or a garden or anywhere like that really (2) I think greenspace is somewhere where there is some sort of natural environment and somewhere you can get fresh air in (1) somewhere with grass and flowers and plants I think

INT: Yeah (1) so somewhere that has some sort of vegetation?

PN2: Yeah (1) I even think you could class little patches of grass and things like that too as a greenspace

INT: Yeah (2) greenspace seems to be so many different things! To give you a bit more information on the concept of greenspace is to provide some sort of benefit to you and also bring flood management too (2) are sustainable practices or sustainable drainage systems something you have ever heard anything about?

PN2: I have heard about things like green roofs if that's classed as what you just said?

INT: Yes! That is definitely a method and things like any sort tree planting [points at newly planted trees on the left] can also be a method too

PN2: Oh really (1) you see I've heard of these methods but I would never know them by those names but that might just be me!

INT: That's understandable I think if you haven't ever heard about them being called SuDS or any formal name as such nobody would expect you to know!

PN2: Definitely (2) I wish they would speak more about these things in the media because I really do think people care they just don't realise how much these methods are needed

INT: Yeah (1) so it is something that should be spoken about more?

PN2: Most definitely

INT: I think that is interesting it is something to think about too

PN2: Yeah that awareness is definitely needed

INT: Yeah (2) What are your thoughts on this site? what do you think about how the site looks? Do you like it? Dislike it? Is there anything that stands out to you?

PN2: I do like it (1) um (1) I like I prefer it when the leaves are on the trees like autumn time

INT: Yeah

PN2: Like sometimes like that its like (1) I don't know I just don't like trees when they don't have leaves on

INT: Yeah

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PN2: I find it a bit (2) not pleasant to look at but (1) I do like being in nature and the flowers especially these daffodils (1) are they daffodils

INT: Yes they are yeah

PN2: They've started growing a lot everywhere and it just brings a lot of colour to the space

INT: So is it visually appealing to look at?

PN2: Yeah yeah

INT: Um (2) and how did you find out about the site? Is it just

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PN2: Yeah I just live local and have come here on a lot of school trips and stuff and its like 10 minutes away from my house (1) I have just grown up coming here

INT: Would you say that (1) do you use it (1) is there anything like (1) a specific time of year that you use greenspace more or less?

PN2: Um (1) I wouldn't say in particular I use it (1) I pretty much use it everyday walking the dog

INT: Yeah

PN2: But I'd say like in the summer time or when the weather gets nicer we go on longer walks

INT: Yeah

PN2: So its probably (1) or like sometimes I might meet my friends in summertime for a picnic and stuff

INT: Yeah

PN2: I'd say summertime more but (1) I do use it everyday pretty much so

INT: Yeah and would you say I know you said you walk your dog here (1) is that something you tend to do on your own? Is it something you do with family?

PN2: Typically I do it with my mum

INT: Yeah

PN2: We just walk my dog and my grandads dog um (1) but then obviously sometimes (2) my mum like goes on holiday or something and I have to do it by myself

INT: Yeah

PN2: But um (1) yeah most of the time its with my mum (1) on the weekends my mum and dad because my dad works nights so he doesn't typically go on walks with us but um yeah so mainly family

INT: And what would make you like pick (1) would you pick to visit here (2) over somewhere say like Roundhay Park or Golden Acre?

PN2: Here is the easiest for me because it's the closest um (1) but sometimes I'm like shall we try somewhere different like go to Roundhay Park or shall we (1) if we are going somewhere we might stop off you know on the way

INT: Yeah

PN2: You know what I mean? But this (1) Temple Newsam is the place we go most just because of its proximity to our house

INT: Yeah (1) and would you say that (1) does that play a big part in which greenspaces you visit because understandably so you want to be able to visit somewhere that's close to you

PN2: Yeah its nice to go places that are within walking distance if that makes sense so it avoids having to go in the car anywhere

INT: And what is it (1) do you think that there's any specific features or anything or like the facilities here?

PN2: I don't know if you've ever been but you know the golf course? There's a bit that they have stopped using as the golf course

INT: Oh yes

PN2: It is a lot quieter (2) so (1) and with my dog she's a bit um (1)

INT: Energetic?

PN2: Yeah and sometimes she's a bit unpredictable with other dogs

INT: Yeah

PN2: So I like going there just because it's a bit quieter (1) not many people go and um (2) its just a nice walk (1) like a bit untouched

INT: Yeah

PN2: Because not many people go there I'd say probably that

INT: OK yeah

PN2: It's quite a nice escape

INT: Yeah (1) its nice to be somewhere different especially if you are sit inside working

PN2: Oh yeah definitely (1) I completely agree

INT: And I know this is quite a broad question to answer but how would you (1) it doesn't have to necessarily be this site but how would you say being in greenspace makes you feel?

PN2: Yeah definitely more positive um its just a good de-stressor

INT: Yeah

PN2: I remember when I was at uni and I was like in my final year and I was just really really stressed

INT: Yeah

PN2: It was just good to get out and just like just take your mind off it and just walk you know like (1) take some of that energy out and put it into something more positive and then just clear your head

INT: Yeah

PN2: Yeah so I'd say its very positive being in greenspaces

INT: And is there anything (1) like is it just the act of being outside that you think

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PN2: I just feel like inside you don't feel like claustrophobic but you know like you

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INT: I suppose is it like you almost feel enclosed in a way? If that makes sense

PN2: Yeah exactly (1) outside you just have the freedom to go out anywhere you want really (1) it's weird to think about it that your legs are like transporting you somewhere

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INT: Yeah

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PN2: Like if that makes sense?

INT: No I know exactly what you mean

PN2: It's a bit weird to say but its just like instead of being stuck in four walls or in front of a computer screen (1) you've got all this to look at instead

INT: Yeah

PN2: Yeah

INT: And would you say its like the visual (1) I suppose maybe its visual and recreational value?

PN2: Yeah and even like the sounds of like the birds singing or whatever it is

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INT: Yeah

PN2: It's just (1) you see even if you see other people you just see them enjoying the space as well

INT: Yeah

PN2: And doing things other than like staring at a screen all day you know like most people now have got phones like kids even

INT: Yeah

PN2: People are like stuck on a screen or playing video games but like when you're outside you are just enjoying nature and enjoying I'm not sure how you say it (1) enjoying the natural environment

INT: Yeah so is it almost like would you say refreshing?

PN2: Yeah yeah

INT: I suppose as well if you think about COVID and the fact we couldn't really go anywhere

PN2: Yeah exactly and you could only go on like one walk a day (1) yeah its just again that freedom of being able to be outside

INT: Yeah and do something different

PN2: Yeah

INT: Would you say since COVID (1) do you use greenspace more or less or the same amount?

PN2: I think (4) maybe the same but I don't take it for granted now because now I know that it can be taken away if that makes sense

INT: Yeah

PN2: So I appreciate it more

INT: Yeah I understand (2) If we think about the health and or wellbeing element of it I'm really interested to know what you think wellbeing is? I know it is quite ambiguous so don't worry if you are unsure

PN2: I think wellbeing is a bit of both a mental and physical thing

INT: Yeah

PN2: When I think of wellbeing I think of I think I slightly go to the more mental side of it but like I said I think it's a bit of both like by doing a physical activity you are improving your mental wellbeing

INT: Yeah and would you use this space or a similar area to improve your physical or mental wellbeing?

PN2: Yeah definitely (1) like I said about uni or whenever I am stressed it just helps calm like it just adds a calmness to you and I think you just have time to think things over and clear your mind and (1) for fitness on a fitness physical side I mean walking and I sometimes go on bike rides and I used to (1) in tried to do that couch to 5k

INT: Oh yes

PN2: I think I did it for about four weeks but that's not because its nothing on like the being in here [the greenspace] that affected it I just couldn't be bothered! I didn't want to run I didn't enjoy it!

INT: Yeah I think that is fair enough!

PN2: I go on walks and bike rides and stuff so yeah

INT: Yeah and I suppose as well aside from wellbeing can you think of any other benefits a place like this [a greenspace] could provide?

PN2: I think it can provide environmental and social benefits to people and the environment (1) yeah socially people come here and meet their friends and have picnics stuff like that environmentally (1) I

think people are just using the space and looking after it and like you can see today it is the busiest I have seen it

INT: I think as well as we get towards the end of the interview (1) I know we have spoken a lot about the benefits of greenspace but do you think there are any negatives?

PN2: Sometimes having to pay can be a bit off putting but I would do it if I knew it was going to benefit the greenspace (1) the only other thing I can really think of is sometimes from a safety point of view I suppose like sometimes if I was walking through a space on my own and there was no lighting or there was antisocial behaviour I might feel a bit intimidated by that

INT: I understand (2) and would that put you off the greenspace?

PN2: I think while I know it isn't the greenspaces fault as such it would maybe make me think about the times of day I would use it so say I would probably go earlier on as I would feel a bit safer doing that if that makes sense?

INT: Yeah that does make sense I understand

PN2: I think as well it depends how much it is happening like if I know there is a safer greenspace than where the antisocial behaviour is I would go elsewhere instead but it doesn't tend to be an issue here (3)

INT: Yeah

PN2: I think greenspaces are great and they are so nice to use so it is a shame to see anything negative going on in them

INT: Yeah that makes complete sense, its not something you want to see (2) and I suppose as well it is nice to come today and not see that and see a really nice atmosphere

PN2: Yeah I have really enjoyed this walk it has been really nice to do

PN3 Transcript – Roundhay Park - 16/4/23

INT: I thought we could start off by talking about greenspaces more generally

PN3: Yeah

INT: So there's this whole idea that greenspace can provide lots of different values whether that be social or recreational but also they can help with flood management

PN3: Oh yeah

INT: So I suppose if you think of somewhere like Roundhay Park (1) when there's heavy rainfall the lakes can hold a lot of that water that runs off into them or if you see all the trees and depressions in the land water can also go here 1) and I suppose really I'm interested to know if this 0is ever something you have heard about before?

PN3: I know that they must be good to help with flooding but I don't know much more than that

INT: Yeah that makes sense (1) these practices have lots of different names and there's these solutions called sustainable drainage systems or SuDS which are things like having ponds, or concrete that water can go through or filter strips to help with pollution

PN3: I have heard about SuDS briefly because I think theres a new site near the office (1) where they are converting what is essentially like (1) a tip (1) its like this tiny piece of land near the river that people just throw their rubbish and they're converting that into a tiny park so I have heard about them wanting to make more greenspaces (1) its also kind of what they are doing at the Corn Exchange (1) with all of the moss on the bus stops and making it green but that's about as much as I know

INT: Yeah they basically incorporate all the different thins whether that be from a social aspect or the ability to reduce flooding (1) they create a multifunctional space really

PN3: Yeah

INT: I suppose to begin with I just really want to understand what do you think about the site? Is it somewhere that you like or dislike?

PN3: Yeah so we usually come on a Sunday to be honest because we only live like (2) fifteen-ish minutes away

INT: Yeah

PN3: So we usually do the walk down and then we cut down where the little lake is which is always cute with the swans (1) and there's a swan nest too (3) we do quite often comment on that though and it is quite sad that a lot of the time there is litter in their nest which is quite sad (2) but yeah and then the rest of it is really well kept and we come and watch the people rowing

INT: Yeah and would you say you just mainly use it for walking?

PN3: Mainly (1) we've been to like (1) there was a circus so we took our niece and nephew to the circus (2) we didn't come to the light show because it was during COVID and it was difficult to get to but we did think about coming to the lightshow (2) I'm trying to think what else has been on (1) oh and like the food festival and stuff we've come to a few of them as well but yeah predominantly it is just to for a walk round

INT: Yeah and would you say is it [the greenspace] somewhere it doesn't just have to be Roundhay Park it could just be greenspaces generally (1) do you go with the intention of just getting outside or is there a specific purpose? #

PN3: We use it for exercise and that is always the point of going is like oh we're going to go do a walk but I think a lot of the time we are like oh we're in a rut or a bad mood or whatever and exercise will help with that (2) and its obviously like (1) a lot more gentle it doesn't really feel like exercise so we do use the parks a lot more than we use our gym membership

INT: Yeah! And do you think you use parks more for exercise because its outdoors?

PN3: I think this one [Roundhay Park] has nicer scenery and also because it is so close because we do go to (1) the Meanwood valley trail quite a bit (1) we like that one too (1) and I would say that one is arguably prettier but (3) but yeah the convenience of it and I say its close as well but we purposely bought a house near the park [Roundhay] so we knew it was somewhere we could come and we walk around a lot going oh when we have kids this will be good and this will be good

INT: Yeah and that makes sense! If you have somewhere like this on your doorstep you are going to use it and think about lots of things you want to do here too

PN3: Yeah and there's a lot of things too that we haven't done here like we have never been on the train (1) I have never been to the Lakeside Café (1) my boyfriend has been a few times but I have never been and it's things like that that we're like oh when we have kids we'll do those things together so there's no point wasting it all now!

INT: Yeah!

PN3: And the queues are always so long which puts me off you know sometimes I think oh I could really do with a bottle of water or something like that and you just think no that queue is too long and I'll manage without!

INT: Yeah I think it can be quite nice just to be outside

PN3: Yeah and I think it can be any greenspace as well (1) so like when I was (1) during COVID I lived in the city centre in a one bed flat and there was literally a patch of grass (1) well it isn't a patch of grass to be fair Lovell Park is quite big but like the bit closer to where I lived was literally a patch of grass and even that was just nice to just go sit on and it was basically a hill that they could never build on so they put some grass there (1) but yeah that was nice too particularly during COVID (1) it was the only grass I had!

INT: Yeah its nice to have a change of scenery

PN3: Yeah I think that's the other thing (1) I do go into the office because its not that far away its like a bus journey away but my partner is fully remote (1) so he could go to Sheffield office but that's quite a trek away an this is like what he does to get out at lunch time he will come and walk to the park and he'd walk around the little like rather than this one as obviously this one would take longer

INT: Yeah that makes sense

PN3: I thin someone said that you should have a morning and evening commute

INT: Yeah

PN3: So its kind of like his version of that

INT: I suppose it brings routine to your day?

PN3: Yeah exactly that (1) well he tried going the other direction and just you know walking round some houses but (1) found It wasn't very helpful for him so (1) he uses the park more

INT: Yeah and I suppose as well from that point of view and the wellbeing element of it its interesting to think that greenspaces can be something for recreational or social value and even a form of flood management

PN3: Yeah

INT: I suppose linking on from that to you (1) what would wellbeing be to you? Is it a physical thing or a mental thing or both or something else?

PN3: I would say that it's a bit of both its probably a bit more mental (1) in terms of you know being OK and being happy (1) but I think there is a physical aspect in terms of like (1) but I think it kind of builds on the whole thing that if you're in a good mental space you're probably in a better physical space as well

INT: Yeah so they kind of bounce off one another?

PN3: Yeah so the other thing if you've had a bad month and are in a bad mental space you are probably staying home and not doing very much (2) and I suppose the physical element can put you in a bad mental state (1) but yeah I suppose wellbeing is a bit of the two but a bit more of the mental outlook and positivity

INT: Yeah and with greenspace (1) do you think that there's other benefits aside from wellbeing?

PN3: I think everything it provides for the general public aside from flood defences and things like that is quite wellbeing based and focused on and the whole sense of community and things to do give you reasons to get out and about while promoting exercise (1) I think all of that is important for wellbeing

INT: Yeah so it is almost multifunction?

PN3: Definitely yes definitely (1) and I think as well it changes with your stages of life because I know that there's loads of mummy groups that come here and like if you were to ever do a walk mid-week there'll be so many different groups of people hanging out and then there's obviously all of the sports clubs and a running group and some like army fitness things too and even if its just building a family friendship community both inside and out of the park its good too

INT: Yeah it's the sort of space that you can use on your own but also with other people if you want too

PN3: Yeah definitely and I think there's different uses like playgrounds for the kids and more difficult longer walks for children you know I'm sure there's also the negative side of anti-social behaviour that goes on too but that doesn't bother me too much you know there's lots of different things going on (1) there's different routes along the hills

INT: Yeah (1) and I suppose to round up on this is there anything else that you think is happening in greenspaces?

PN3: I don’t think there’s really any negatives other than some anti-social behaviour but I think in a place like this that is such a huge greenspace you can avoid it and go somewhere else instead so I don’t think there is anything really

INT: Yeah

INT: To begin with I thought we could talk a bit about greenspaces and what they are (2) so with greenspaces we have this whole thing (1) You may of heard about it before but it is this whole idea of it (1) that greenspace and outdoor areas can also be a form of flood management as well as somewhere for people to use and I mean to begin (1) is this something you have ever thought about?

PN4: Yeah yeah I have (2) so the last place I lived (2) it used to be a disused golf course just beside the estate and it had a stream running through it (1) so that had been converted into a flood management (2) a catchment area so you can walk past it in spring and summer as it did tend to flood at other times of the year

INT: Yeah I can imagine that it gets quite full at certain times of the year! Yeah its this whole idea that particularly with greenspaces (1) while they can provide flood management they can also provide added benefits whether that be a recreational value or social and be almost a multifunctional space as such and there's this idea which you may of heard of called sustainable drainage systems or SuDS

PN4: I don't know if I've ever heard of that particular thing but the concept sounds familiar (1) I went for a walk the other day and there was actual one [a SuDS device] that I just came across and it was a pond with some vegetation in but so I have seen them before but I don't know specific ones

INT: Oh that's interesting (1) yeah that pond is definitely an example of a SuDS device that is really useful and interesting to hear about your walk too (1) so it's this whole concept of pairing flood management with the more social side to form things (1) I know we have just begun to consider this (1) but to you (1) what do you consider to be greenspace? What is it [greenspace] to you?

PN4: Yeah I think that was part of the questionnaire that I struggled to kind of define it because every time I'd (2) put something down I'd think of a different type of space (1) but I'd say plants and grass and trees (1) wildlife and (1) that type of thing but that also links to what you were saying about the flood management stuff as well like ponds and stuff so that would be more blue space I suppose (1) but I feel like that kind of incorporates in that as well

INT: Yeah that they [blue and greenspace] kind of link together?

PN4: Yeah cause I think (1) so one of the questions that you asked on the questionnaire was (2) you know whether its [greenspace] something important to wellbeing or mental health and whatnot and I noticed that the last time I spent outdoors in nature my mental health seems to trend a certain way

INT: Yeah

PN4: So yeah I have you know spending time out recently (1) I've noticed that even sometime outside just walking through a park on the way somewhere is just better than not

INT: Yeah (1) Do you think there's anything like specifically about a greenspace? Is it being in the fresh air or the appearance of the site? What do you think it might be?

PN4: Yeah so the appearance (1) yeah the fresh air as well plays into that (1) I think the noise as well that plays into it as well (3) you know if I can walk through a greenspace and avoid going along a main road that's quite noisy its much more pleasant just on its own

INT: Yeah

PN4: I've found it to be (1) this is one of those things that you know there are so many things to say (1) but the park next door [to where I live] they don't really have the any lighting so to speak inside the park which can be a deterrent to a lot of people but (2) you know just going for a walk at night its quite nice to see the stars and stuff like that so it nice

INT: Yeah I think its an interesting point because some people will go to these spaces and the fact that if there is lights or not might be a big influence or you might go and not think twice about that (1) like you said to some people it might be a deterrent (1) it's a really interesting point (2) you know you mentioned you walk a lot in these spaces (1) is that the main thing you use them [greenspace] for? Have you ever used it [greenspace] for anything else?

PN4: So I use it for socialising as well (2) because we have this outdoor space nearby so close (1) my friends come with me when the weather is nicer and we just hand out there really (1) but yeah I think for me its mostly (1) at least at the moment for recreational and sport focused (2) I do quite a lot of cycling and stuff like that so its one of the main reasons that I'm outdoors but (2) you know walking the dog and things like that (1) I used to (1) I used to just go into the parks just for reading and whatnot (1) I think there's quite a few reasons for it (1) sometimes its quite nice to just go out for a break and to sit outside

INT: Yeah I think it can be sometimes a nice escape especially if you are sat inside (1) it can be nice to have a change of scenery and be somewhere different to where you're maybe used to being most of the day

PN4: Yeah exactly (1) I completely agree with that (1) and I think there's a (1) I just remembered there's (1) I've seen something about this about how humans eyes have evolved to pick up more shades of green than any other colour (1) and its just a natural adaptation to being outdoors you know to being outside and being in greenspaces you stimulate those nerves in your brain(1) I think it's a good way to engage as well (1) you know because at the same time its hard to describe but when your inside and you are looking around and its just pale walls and its nice being out and it's a good change of scenery

INT: Oh yeah definitely (1) its refreshing

PN4: Yeah (1) I just remembered as well that there's this little built space outside one of the stations in Manchester and it's slightly tilted so it's got like a gentle little hill and there's just a little stream running around it and you can just hear water babbling which is really pleasant and it makes me want to take my headphones off on the way to work as its quite nice to hear everything

INT: Yeah its like the sounds of it [greenspace] can sometimes be quite relaxing (1) I'm trying to think of the best way to describe it really but its almost as if you can't replicate the sounds you hear in a outdoor space unless you were to record those sounds or something (1) you are not going to hear those sounds anywhere else other than if you were to go (1) for example the sound of a stream or (1) the sound of rain (1) you only hear those sounds when you are outdoors somewhere

PN4: Yep yeah I think there's the whole social aspect of it that I think you know (1) you can just bump into people that you wouldn't speak to otherwise (1)

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INT: Yeah

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PN4: Even if it is just a passing conversation its nice (2) which (1) seems to be a bit more difficult in indoor environments unless you're in a particularly good restaurant or café sort of thing

INT: Yeah

PN4: It [socialising] relies on people as well so its (1) I feel like it (1) there's also a community aspect of it as well cause you are likely to see similar people outdoors anyway (1) overtime so (1) if you don't socialise particularly a lot there's that avenue as well for some people

INT: Yeah and I know you mentioned this before but would you say you use these spaces both (1) would you say it's split the same amount that you use them on your own and also visiting them with people?

PN4: Yeah I think it's a 70/30 split just because I like to do things away people and on my own

INT: Yeah that's completely understandable and I suppose linking onto the wellbeing element of it which we have briefly spoken about (1) but what would you say (1) what to you is wellbeing? Is it a physical thing? A mental thing? Is it both or something more than that?

PN4: Yeah I'd say both so obviously physical doing exercise which is always nice (3) mental to me is just being outdoors like I said that's nice as well (1) there's the social aspect to it as well and there's the (3) community aspect to it as well so you (2) I have joined loads of groups just by being outdoors and meeting like minded people and finding out that there's cycling clubs and things like that that I wouldn't have found otherwise (2) so there's that (2) I think like you said there's the environmental aspect of it as well (1) you know why concrete over everything it's (1) you know (1) unless there's a very specific need for it then you shouldn't be doing that (2) yeah (1) those are the main things I can think of

INT: Yeah I think like you said wellbeing can be so many different kinds of things

PN4: Oh (1) this has actually made me think of something (1) so I've been reading this book that might be of interest (1) it's called 'curbing traffic' and it's written by these people who moved to the Netherlands (1) to (1) for family reasons and what not and they've (1) delved into different aspects of living there (1) and I think one of the things that they say about it is the benefits of the greenspaces (2) it's often portrayed in contrast to the built environment but at the same time the built environment can be better so if they don't compete but should actually work in tandem (1) like noise reduction and making places walkable or for cycling that type of thing (3) making it [built environment] more appealing so they [individuals] don't feel like they have to (1) you know obviously there's that option there but make them work in tandem so they don't have to pick between places as opposed to putting one against the other

INT: Yeah so its almost as if we can have both these spaces and then both be useful and beneficial but at the same time its not the sort of thing were you can either visit a greenspace or you can (1) go for a drink in a city centre (1) yeah the sort of thing where they both kind of balance (1) each other out which I think is really interesting to think about that and it links quite a it to COVID too because it seems to of influenced not only on how people use greenspace but generally influenced peoples outlooks on where they're going and what they are doing because people almost value their time (1) a bit more because we are not you know stuck inside and I suppose do you think for you the pandemic has had any influence on (1) you using greenspaces at all?

PN4: Yeah I think you just cemented the fact that greenspaces are very valuable to me (2) I think that was one of the lifelines throughout lockdown (1) I know I mentioned the disused golf course that was

turned into a walking sort of park thing (1) and just having that on my doorstep (1) that was really handy (1) I did cycle a bit on the quieter roads which was really pleasant which could be nice (1) and I felt safer but on days where I just wanted to get some fresh air or I just wanted to go out or have my lunch (1) that [greenspace] was perfect for having nearby and I think without that I wouldn't have realised how important it is like I knew that in the back of my mind that it is positive (1) but it [COVID] really cemented that fact and I felt (1) like being very candid I did let that slip recently like I've just remembered that its really important and I'm forcing myself to spend more time outdoors

INT: Yeah I think as well you know its always in the back of our heads to go outside and its not that we don't wan to go to these spaces but its almost like the act of going right I'm actually going to get up and go out is just as much of as thing as actually going to that space and going for a walk or meeting people or whatever you choose to do

PN4: Yeah I think the accessibility does play a big part to it as well (1) I used to live in the middle of a suburbs in Birmingham and there was a couple of parks and stuff around but none of them were particularly great quality (1) so whenever I wanted to go for a hike or anything like that it was (2) no pun intended but it was a trek getting there! It was quite annoying and almost a deterrent (1) you know having to travel and do that it was good but I know there are people who don't have the means to do that whether that's financial or just accessibility wise (1) so having those places more accessible and nearby and of better quality I think its very important

INT: Yeah it may encourage people to use them [greenspace] more (1) especially if people don't have much access to them often too (1) it's a really interesting point to think about and way to look at it especially if we think about how greenspace affects people you know it might positively affect some people and negatively affect others so its important to think about for definite

PN4: Do you mind elaborating on that like in what sense might it not benefit people?

INT: Yeah so for some people it might be from a safety point of view people might not feel safe visiting greenspaces or might feel like they would prefer to go with someone else if they are worried about anti social behaviour they might be put off using greenspaces (2) it could also be things like allergies so things like hayfever you might feel less inclined to use a greenspace particularly in the summer when there is lots of pollen you might want to do something else instead (1) those are a few examples you know these things might not inherently be the greenspaces fault

PN4: Yeah its things like anti social behaviour and whatnot (1) that makes a lot of sense I hadn't really thought about those things in much detail before because it hadn't massively affected me (1) I think too those things can be addressed too whether it be using greenspaces with local groups like running clubs and stuff that welcome people to come and join or walking groups you know those things can be addressed to a certain extent to I think (2) you know while those negatives are there I don't think they are end all

INT: Oh definitely (1) things can be done to improve those things and help people

PN4: Yeah definitely

INT: Before I stop the recording is there anything else you would like to add?

PN4: No I think that's everything (1) I have found this really interesting thank you

INT: I thought to begin with we could talk a bit about greenspace (1)

PN5: Yeah

INT: So a lot of thee sites so its greenspace but they are use for flood management (1) they are able to hold a lot of the water that runs off from urban areas

PN5: Oh really I didn't know that (1) no I didn't know that

INT: Yeah so when there's a lot of rainfall (2) greenspaces while also being able to provide lots of different things they can collect all this rainwater that would otherwise go into Leeds City Centre and potentially cause a lot of flooding (1) and there's a lot of (1) the government are really trying to push alongside more housing they are really trying to push creating more sustainable building practices that incorporate the natural environment

PN5: So where would an example be?

INT: Have you been to Skelton Lake Services before? They have a green wall that is a good example there is lots of grass and vegetation on it

PN5: Oh yeah (1) there's a place that has a living wall somewhere else as well at Cross Green the recycling place has one of those (1) so is it that kind of thing?

INT: Yeah it is that sort of thing (1) they are called sustainable drainage systems of SuDS and its looking at how these places provide something to both people and nature

PN5: Oh that's really interesting to think about I haven't heard about them before (1) its bad really because at my age I don' tend to think about climate change and things like that and I don't mean that badly because we do our best in our lives and that's what's important

INT: Yeah its interesting you say that and I think the most important thing is that you do your bit and that's all you can do

PN5: Yeah exactly we do our best like we all know its happening (1) we all have to make changes even if those are minor things

INT: Yeah that is the best way to look at it as well (1) it is something that a lot of people are aware of too (1) I think with that in mind I suppose a good place to start with our conversation is what is greenspace to you?

PN5: Anywhere that's open (1) to me it doesn't even necessarily have to be green its just somewhere that's an open space that hasn't got any buildings or anything on it

INT: Yeah so just somewhere outside?

PN5: Yeah somewhere like this [Roundhay Park] so I mean you could say it's a greenspace but even if I was in a woodland to me its still a greenspace because there's no buildings there's no pollution its just peaceful and nice

INT: And what is it about these sites? How does it make you feel?

PN5: It's good isn't it (1) I find it calming (1) you know you're making yourself fit by walking and I think it just clears your head doesn't it (1) it really clears your head and even like now because I have

this cold it still does make you feel better (1) I get quite stressed and have anxiety so I find it really calming

INT: Yeah I can see why (1) you know if you've been inside or something or wherever you have been it can be a change of scenery just being somewhere different (1) whether that be outside in a greenspace or even inside doing something too

PN5: And its seeing nature and seeing other people (1) I mean I suppose I'm lucky as I work in the community so I see people constantly so sometimes its nice for me to be on my own but then with people like my friends work from home (1) so she doesn't really see anybody so to come out and do this she gets to see people and interact with people if you want or just put your headphones on and be on your own

INT: Yeah (1) that makes sense (1) you can interact if you want to but also have the option to take yourself off and walk on your own if you prefer

PN5: Exactly

INT: And do you think its anything specific to here [Roundhay Park] that you specifically like?

PN5: I think it's the (1) well we live in Crossgates so we've got here [Roundhay Park] and we've got Temple Newsam but here for me it's the big lake because (1) there is a couple of little lakes at Temple Newsam but not like this (1) you've got fields you've got a lake and you've got woodland too there's a bit of everything too

INT: Yeah there are lots of different things to do here (1) is there (1) it might not just be here it might be in general (1) do you find greenspaces have the same purpose for you? Or would you say like here [Roundhay Park] you might walk the dog and somewhere else you might do other things?

PN5: I think it's the same everywhere (1) if I lived near the beach then that would be my space because I'd prefer that to anywhere (1) I do like somewhere with water as I love being near water but I suppose anywhere really just anywhere that's open (1) so even if I could (2) as daft as it sounds I could just go sit in a big field with nothing there or just (1) the lady at my CBT [Cognitive Behavioural Therapy] thing used to say to me just look up because if you look up its all just there and to take it all in

INT: Yeah and that leads on quite well into the wellbeing element of it all (1) and I know its quite a broad question but if someone asked you what wellbeing was (1) what would your response be?

PN5: I think its looking at a person as a whole isn't it (1) because if you're not physically well that affects your mental health and your mental health can affect your physical health so I think its (1) looking at that person as a whole (1) person and taking everything into consideration (1) yeah that's how I see it

INT: Yeah because they both balance the other out or balance off one another if that makes sense

PN5: Yeah

INT: And would you say (1) would you say greenspace has an affect on your mental or physical health?

PN5: I'd say it affects both (1) because it helps me clear my head (1) because we have a bit of a stressful house because we've got an autistic son and then my elderly mum lives with us so the two combined drive me and my husband insane! So this is like our escape you know so we can get out

the house and we can talk about things while clearing our heads while you're getting fitness aren't you and getting physically well because you're walking and doing some exercise (2) so I'd say it helps them both

INT: Yeah that is understandable (1) it can help you clear your head (2) is it just the act of being outside that benefits you?

PN5: I think it's the act of being outside but being away from people sometimes too because we very rarely get any space so its nice to come out with my husband even though I'm not on my own which I'm happy to do it on my own but I'm also happy when he comes with me so we can have time just for us to talk together (2) so yeah

INT: Yeah (1) would you say obviously I know with COVID and everything going outside was one of the only things we could do (1) would you say COVID has had any sort of influence on how you use these spaces?

PN5: I think we use it more now to be honest because I think since (1) as soon as somebody says to you that you have to do something like you have to stop in everyone rebels and says well no I'm going out so I think (1) well we did couch to 5k (1) through the lockdown (1) we don't do it now but we did (1) and (1) because I've got something wrong with me and with my son having learning disabilities we had to shield so (1) it really affected Josh's mental health to be honest and it took him a long time to get back into things (1) but for me I couldn't of (1) I still needed to get out and like I said we did couch to 5k (2) and by the time COVID had finished we were running like 5k about three times a week and it does wear off because once you're back at work you can't keep it up and that's why we tend (1) everyday we do go for a walk we don't (1) always come here but (1) near (1) do you know Crossgates at all?

INT: Yeah yeah

PN5: Well do you know where (1) you've got Manston Lane and the little mini roundabout if you turn down there there's a disused railway track and we'll walk that because down there there's not many dogs so it's one place we can let the dog off as well so yeah even that I see as greenspace because yes its built up around you (1) but you can hear birds you don't hear traffic you hear everything else that's going on

INT: Yeah its something more natural to look at

PN5: Yeah definitely

INT: It can be a nice change of scenery to visit different places too

PN5: Exactly and that is really nice

INT: Yeah I bet it is (1) I know we've spoken a lot about wellbeing and the flood management aspect of it too but do you think there's any other additional benefits or barriers to using greenspace?

PN5: Its for the wildlife isn't it? We don't have much wildlife left as it is so yeah places like this that are just left untouched is great for the wildlife from the littlest thing up to all of the birds and everything because there'll be foxes and potentially badgers and things like that and even as daft as it sounds people might complain about that being woodland [points to woodland] but that's good because lots of animals will use that

INT: Yeah and if you look at like that tree that has fallen down [points to tree] isn't likely something deliberate that the park have done (1) the animals can use that to nest

PN5: Yeah its nature taking it for whatever reason but you know hedgehogs and things like that will use it

INT: Yeah

PN5: So yeah we need this for nature because (1) like for example my husbands family live up near Churwell and Morley and the one space that was always there from us being brought up in that area was all the farmers fields and they're now building along there too and there's literally going to be no greenspaces up there really apart from the odd little park (1) but like we were saying little towns like that and I know it's a bit different to here [Roundhay] but Churwell Hill is a really busy place and they're making about 500 houses there (1) its sad that they are getting rid of all the greenspaces it's a shame to see

INT: Yeah that is understandable (1) it is trying to find that balance between building housing and creating and protecting greenspaces too

PN5: Yeah and I really like bird watching and looking at all the wildlife and you do worry about where it is all going to go

INT: Yeah would you say that's a concern for you?

PN5: Most definitely I think that's a big problem at the moment because in greenspaces I don't think there are many bad things or anything other than people sometimes not putting their dogs on leads and the odd bit of anti-social behaviour which can be resolved but the main issue is with all the wildlife being removed

INT: Yeah that makes sense (1) you want to be able to protect it where you can

PN5: Yeah even if you have to pay or something you want to do exactly that

INT: Yeah

INT: So to begin with I thought we could talk about greenspace and what it is and with greenspaces we have this whole concept (1) and there is this method called sustainable drainage systems (1) some people also call them SuDS (1) I'm not sure if you have ever heard about these before?

PN6: I actually have heard of SuDS (1)

INT: Oh that's interesting

PN6: Yes I have (2)

INT: What do you know about them?

PN6: So I know that it stands for sustainable urban drainage systems and (1) the (1) point or the purpose of the technique is to sow the flow of rain that is (1) that falls because the issue with modern drainage is that it very quickly takes the water that's fallen away from that area which is positive however it does have a negative impact especially on rivers because (1) the hydrographs becomes a lot more flashy and can then mean that you have a lot of river flooding

INT: Yeah

PN6: So the point of sustainable urban drainage systems is to go back to some of the more natural (2) methods of (1) dealing with rainwater by slowing the flow and you know re-meandering a river or putting in some drainage or some vegetated drainage

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INT: Yeah like tree planting or swales or maybe a pond with vegetation in

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PN6: Yeah as well they can try and store the water where it lands before it slowly percolates through the soil and then makes it way to the river in a much more natural way s then the river isn't overloaded with water

INT: Yeah! It is exactly that and I think you have made a really interesting point by even just having some awareness of SuDS as a big issue and barrier to implementing them is that its very difficult to promote the use of SuDS and greenspace because people don't know what these things are

PN6: Yeah I think also sometimes people see it [greenspace and SuDS] as a waste because they (1) in their minds their drains work (1) so why would you want to change that whereas actually its not that their drains don't work because they do they are effective (1) but what it is its about the sustainability and the changing climate means that we are going to have to deal with more water (2) so more people are at risk of flooding especially with the increase of building houses on flood plains so actually SuDS isn't a waste its just a different strategy that actually harks back to before the Victorian era (1) when they started putting in modern drainage (2) and it brings us back to nature and also the other positive and I'm sure we'll get onto this is the greenspace that is created within communities to be close to the houses so it's just two-fold (1) it's doing its have greenspace which you know is very beneficial to everybody and wildlife and it is also stopping people from being flooded

INT: Yes and its that whole idea that a lot of people think out of sight out of mind so if it doesn't affect them then why should they have to fund it or maintain it in some way but I think as you've

mentioned with sustainable drainage its not just providing flood management (1) we have social and environmental benefits from it as well

PN6: Yes definitely

INT: So I suppose generally with this site in mind (1) what do you think about it?

PN6: I was actually quite surprised by the size of it (1) I knew it was quite a large park but there's also a very large lake which surprised me (1) I am always quite impressed by the amount of trees that are here they seem to be quite old or established mature trees and it is also surprisingly hilly (1) its quite nice that there's different routes you can take round the park you know there's the main path around the lake but then having other trails you know promotes sort of exploration within the park which is quite good

INT: Yeah and how does it make you feel?

PN6: It's quite calming (1) getting back to nature (1) I'm quite a stress head sometimes (3) so actually coming back to nature and just like I think it helps me slow down and just sort of appreciate that actually whatever's happening is like on the grand scale of things its five minutes of an issue whereas if you compare it to a tree that's been there for like you know hundreds of years of you know just sort of sitting and admiring the view or looking the water just flowing (1) I personally just find that very calming (1) I come from quite a (1) semi-rural area so I grew up with lots of greenery and nature round me so for me it sort of brings me back to my childhood a bit more because its just very (1) I feel like I can just take a deep breath but also lots of people (1) no ones rushing everyone here is here for a leisure purpose or you know so therefore it makes you think well its slowed down you know instead of feeling like you're rushing to get everywhere like you would you know on your day to day when you have got to get stuff done (1) this is more you've come for leisure you're coming to just be outside and just be (1) you're not necessarily here to do anything you're just here to be

INT: Yeah and I suppose as well its more so as well know calling it an escape sounds dramatic but

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PN6: No but it is it is definitely because also its different you know some people will only come out to like a park like this once a week so for them it is an escape from the day to day because it's doing something that you don't do five days a week or even you don't do seven days a week and you only do it every couple of weeks or you only do it in summer or you only do it when its nice you only do it like you might meet up with people here because it's a good mid ground so its something that's different in your routine

INT: Yeah and would you say and it might be about greenspace generally (1) to you does all greenspace have the same purpose? Or do you think its more some are more for walking round or others more sociable

PN6: For me I think it depends on the size of the greenspace (1) so for a park like this or example War Memorial Park in Coventry or Hyde Park in Leeds they are quite large open and quite established places of greenspace (1) I use them in more of a social way either I'll meet up with someone and we'll go for a walk there or I will take myself on a walk there but like other greenspace like for example a children's playground (1) that for me I would avoid like the plague! Or if its for example some green area next to a bus stop for me I very cynically look at that and think that's to tick the quota so for me its (1) so when I come to a larger park which is more established as a leisure (1) park that is when I go into leisure mode whereas other parks that I see that I might go past or bits of

greenspace that are grass or of some trees I more so think of that as just being oh that's the quota that someone has had to fill in their development

INT: And expanding on that (1) would that to you influence what you class to be greenspace? Would you think a place like a park would you class as the same as a verge or a patch of grass? Does greenspace maybe have different levels?

PN6: Definitely but I think I think because I'm very literal because the grass is green I will class that as a greenspace because it is green because it is a place of nature but (1) I don't class them to have the same value or quality as each other so a grass verge I would class as the lowest of the low of greenspace (1) this [Roundhay Park] I would class very highly because there's lots of different environments within the greenspace but then for example (1) just to really flip-flop (1) for example a green roof may be on a bus stop I've seen quite a few initiatives that have a green roof bus stop I would class that highly (1) even though the size is small because I know that actually that has very high ecological impact because it creates a home for other insects (1) so I think not only is it (1) the size of it but its also what other benefits does it have not to the actual humans (1) but to the ecological to the biodiversity of an area (1) so I think for me I would rate those places more highly then (1) a grass verge that was just seeded with grass and a dandelion

INT: Yeah and as well (1) the useability of (1) you could go for a walk around somewhere like this whereas a grass verge

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PN6: People will walk on but they won't go to the verge for a walk (1) but then I suppose people also people do use the bus stop they don't use the green roof of the rooftop

INT: Yeah its like an added element of it

PN6: Yeah and I think I'd put more green roof bus stops in than I'd have grass verges personally

INT: Yeah I suppose aesthetically its maybe nicer to see (1) and that links quite nicely to moving into the wellbeing aspect of it too (1) I suppose first the best to start is to you (1) what is wellbeing? I know its quite a big question to ask

PN6: Well wellbeing encompasses a few different things obviously there's the first divide which is your physical wellbeing and your mental wellbeing and your physical wellbeing is you know (1) how healthy you are you know if you eat the correct way (1) how does your body you know function is it functioning efficiently or functioning to the best of its ability and then there's obviously the mental wellbeing which is obviously a lot more about being able to take a break from thinks being able to unwind (1) we know live in a very fast paced instant society (1) so actually (1) your brain is constantly firing because things have to be done or it feels as though things must be doing in that instant you have to get it finished you have to do things whereas (1) when you come to a greenspace the whole purpose of that is to just be in the greenspace there's no (3) other (1) you know (1) a lot of things now seem to be multifunctional (1) you know you work and live at home or you study at home or whatever it is and then you know in your job you haven multiple roles you know you do your main job and then you have different facets to that so it's nice to be able to come to a greenspace and just do one thing and all you have to do I walk or run or catch up with a friend and then its able to slow your brain down and it helps make other stressors go to the back of your mind and you don't have to think about them as much which does help your wellbeing (3) so you know the wellbeing of that is being able to feel more balanced

INT: Yeah and I suppose as well from a physical and mental point of view they almost bounce off one another but you could

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PN6: Yeah so if for example you broke your leg and then you were unable to be mobile and you were indoors or you were you know stuck somewhere you might feel sadder because you can't do things or everything feels that much harder because (1) you are unable to do things the way you are used to doing them and equally if you (1) if something has gone on in your life or you're not feeling very positive or upbeat there's something heavy that's happening (1) your body needs a lot more energy to just do the standard things so obviously you feel more tired or you don't do as much in your normal day to day because you're tired

INT: Yeah that makes complete sense (1) would you say using a greenspace has had an influence on your physical or mental wellbeing?

PN6: Definitely (1) during lockdown I went on a heck of a lot of walks! I was taken out to all sorts of greenspaces just to walk round which was very helpful and it also gave me time to connect with my parents who were on the walk with me (1) and that was quite nice or with other people we met on the walk sometimes (1) and also there have been times for example (2) at the start of my placement year of university (1) there was some quite challenging (1) or it felt like every time I tired to do something there was another hurdle (1) and I just needed to (1) get out the house so I just took myself off on a walk (1) I walked by a canal (2) and that actually was very helpful to be able to (1) not be so angry and its another hurdle but it will be OK it will get sorted and also you can just get out and get some fresh air you know (1) during stressful periods of life (1) getting some fresh air even if its just a walk to the library it can be very helpful

INT: And do you think there are any additional benefits that a site could provide?

PN6: There's obviously ecological and biodiverse (2) positive impacts you know creating nature a home (1) you know homes for otters and hedgehogs and beetles and birds and that is always very positive (1) to try and encourage the (1) nature of Great Britain to return (1) and also I think that having that then encourages young people to come out you know being able to say to your kid instead of you know we're going on a walk which can sort of seem quite boring you can say instead oh why don't we go see (1) for example at the moment its swan breeding season so its quite exciting to be like oh when we go to the park we'll see the swans and we'll see if we can see the nest or the eggs of a signet (1) I think that can (1) having the nature encourages people to come out (1) there's something interesting to see in real life (1) and then I think for me that very beneficial to influence the young generation to show them how much nature there is and therefore why we should not only preserve what we have and increase the amount we have as well so I think that's a benefit (1) obviously the physical benefit of getting outside and getting the fresh air and walking has lots of medical studies that show walking can be very beneficial even if its your only exercise (1) obviously there's the mental benefits and seeing people (1) I think for me the preferred effect is the ecological benefit of it

INT: Yeah that is understandable and they all link into one another too you could use a site for all these different purposes too which is nice

PN6: Yeah its one of those things (1) its so difficult to pick them all apart you know they all link so intrinsically and its one of those things we have to think about a lot more as we've taken away the nature that was here a hundred years ago and at that time people really didn't know about the

wellbeing benefits of greenspace so we have to think why its important to bring these spaces back which is why its so important to have this conversation and tell people how important greenspaces

INT: Yeah definitely and I know we have spoken more about the positives of these spaces but do you think that there are any negatives?

PN6: I don't think I'd ever be put off going to a greenspace (1) I might not like the greenspace as much because you know it might be a flat grassed area which is nice if you were going for a picnic but I don't know if I'd necessarily want to walk across that (1) it doesn't hold the same level of interest in comparison to a place like Roundhay (1) I think the other barriers to greenspace is that its not valued that highly by developers or the government and because its not valued as highly it often isn't included and I know that is changing slights we have got some new planning policies which are coming in which promote the use of sustainable drainage systems especially in large developments but I think that everything nowadays has to have a monetary value and you know a park doesn't have that much monetary value as it is just a place where there is grass and trees which is very cheap but actually the other things that come from it like a café you have to think much more broadly about it you know happier people will be more efficient they'll be more effective and they will contribute more to society because they mentally feel better or are fitter and they are able to work (1) it reduces pressure on things like the NHS too and I don't think people have quite clocked the link between using a park and the pressure on health services which I think people don't know about

INT: Yeah I think that is interesting to think about too (1) from an economic point of view greenspace could provide a benefit or relief to other services like you have said

INT: I've started the recording now. Just to confirm is this route OK with you both?

PN7: Yes

PN8: Yes it is

INT: OK so (1), we will start the walk now

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PN7: OK.

INT: If we just head this way (8). This is more of a (2) conversation

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PN8: OK.

INT: Than anything else (2). Like I said before (1) there are no right or wrong answers (1) the purpose of this is to understand how (2) you both use greenspace and if you find it (2) to be beneficial (1). We will just head down to the left (2) um (1) I suppose the first thing we could talk about are your thoughts on greenspace (1) if someone asked you to define it what would you say it is?

PN8: I think somewhere outdoors (1) just anywhere green I think so like this park I would say is a greenspace

PN7: Yeah I agree (1) I think anywhere with vegetation could be a greenspace whether that be in an area like this or in a city centre too

INT: Yeah so a greenspace is essentially what it says in the name (1) somewhere greenery

PN7: Yeah with vegetation and trees and maybe some kind of lake too

PN8: Yeah I agree

INT: OK (3) So what do you think (2) visually about how the site looks? Do you like it? Do you dislike it? Is there anything

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PN7: I like it but it find it quite annoying that they have not created a suitable walkway in the middle of it (1) which is obviously covered over with mud

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INT: Yes.

PN7: It is not helpful to people who have walking disabilities (2) or possibly children and pushchairs

INT: Yes.

PN8: Erm (1) I like that when you look out over it all you can see is green

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PN7: Not people!

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INT: Yeah.

PN8: And there's trees (1) and things

INT: Like open space?

PN8: Yeah (1) I like (1) that there's no houses in the distance or anything like that

INT: And do you like (2) would you use this site for like any (2) is there a specific (1) thing you would use it for? Or any specific activity?

PN8: I regularly bring my dog here for his daily walk

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PN7: I tend to use

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PN8: and let him off

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PN7: I tend to use it more as a social place

INT: Yeah (1) so you would use it more with a group of people as opposed to (3) on your own?

PN7: Yeah but usually just one other person

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PN8: Me!

PN7: Yeah *laughter* occasionally we bring children too

INT: Yeah (1) as well (1) do you use any of the facilities here (1) like the café or the farm?

PN8: I use the café and if the farm shop is open we will go in the farm shop (1) we don't (1) there is a farm which sometimes (1) if we have got our nieces and nephews we'll go in and use that but mostly its just for dog walking

INT: Yeah

PN7: I use it as again socially (1) because I come to a yearly gig here as well which is nice

INT: What gig is that?

PN7: Its Lets Rock (1) its an 80s concert

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INT: I see

PN7: So we have lots and lots of fun here in the sunshine in June (1) generally it has been wet in the past

INT: Yeah (1) and do you think (1) would you choose to visit here over (1) like another similar greenspace? Say like Roundhay Park (2) or like Golden Acre Park?

PN8: I think I would pick here personally because I can literally (1) walk round the corner to get to it (1) um (1) so it just makes sense and there's less impact on the environment if you walk round somewhere closer

PN7: It doesn't really matter to me because I have to drive whenever I go to a greenspace so (2) I like this one because its not too far from me (1) and there's plenty to do here (1) I do utilise the facilities that are here um (1) but also I'm not too bothered for them as I'm quite happy to bring my own food and have a picnic (2) and just enjoy being here in the fresh air

INT: Is there anything specific that makes you enjoy being outside? Like is there any (1) is it just the act of walking or

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PN8: I just find it calming and cathartic

INT: Yeah

PN7: So since I became the Action Group Leader for Wellbeing at The University of Leeds (2) I have become a lot more aware of the impacts of the environment on our own wellbeing and mental health and so I do try to offer it as support for my students and I also provide it for myself (1) and I like just disappearing off on my own (1) and looking at my surroundings (1) I particularly like looking at the flowers and seeing what's in season

INT: So would you say that you would use a place like this to have an impact on your mental or physical wellbeing?

PN7: It has a positive effect on both (1) but I would say I would use it more for mental wellbeing than physical

INT: Yeah

PN8: I would say both for me (2) I think

INT: Yeah

PN8: Physical and mental

INT: Yeah (2)

PN8: And I think its just (1) uncomplicated (1) I think sometimes you can be very overstimulated when there is so much to look at and everything

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INT: Yeah

PN8: That is does just make you feel calmer (2) and more relaxed

PN7: For me (1) I actually like the smells (2) um (1) there are some disgusting smells also when you have times of the year

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INT: Yeah

PN7: And they are putting fertiliser down but I prefer to think of the (1) senses as well (2) um I find that having the sounds and the visual (1) aspect of it allow me to shut off more than just being here with people

INT: Yeah

PN7: Even when I'm with people (1) I can disappear into my own little world

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INT: Yeah

PN7: If some sort of scent

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INT: So its kind of almost like an escape?

PN7: Yeah it is (1) its also (2) a historical trip because the scents and the sights will take you back to when you might have been somewhere in a previous time

INT: Yeah

PN7: So that brings happy memories too

INT: Leading on from that (2) what does wellbeing mean to you?

PN8: I think its both I think you have the physical wellbeing and a mental wellbeing and I think (1) each are equally as important

INT: Yeah

PN8: You have to make sure that you are looking after both and I think this outside space helps to do that especially for me

INT: Yeah

PN7: I would agree but I also don't think you could have one without the other

INT: Yeah (2) So do they both balance or compliment the other?

PN7: Thinking about it they do compliment the other (1) its nice to be able to have that grounding as well which is important (2) and I don't know if you have watched Zac Efron (2) I can't remember the programme but it is on Netflix and he says something about um (2) him when he goes off and looks for wellbeing across the world and looks at what other people idea of health and wellbeing is

INT: Yeah

PN7: and what he does when he gets off a plane is immediately take his shoes and socks off and touch the ground and just walk on it and feel like he is grounded again which helps him to acclimatise to a new environment (2) I recommend that to my students but I also do it myself

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INT: Yeah

PN7: Not jumping off a plane because I don't have a passport currently *laughter* but um (1) I do like to walk around with bare feet if you know it's a safe area to do so

INT: Yeah (1) and I suppose (1) is it the whole idea that I think especially with COVID and all the lockdowns we were in (1) maybe people felt like coming outside was the only place we could go (1) do you think COVID has had any influence on how you would use a greenspace?

PN8: I think its probably made me appreciate them more (1) when you have (1) because this is obviously right on my doorstep and I think there was a tendency to sometimes just overlook it and (1) just forget it was there

INT: Yeah

PN8: I think especially (1) like you say when during COVID you couldn't travel and you could only have sort of you know an outdoor walk or whatever it became really important (2) and after COVID I think I have kept up with that and you know I haven't lost my appreciation for how refreshing and how it can centre you and ground you again just coming for a walk to somewhere like this

INT: So would you say that you use greenspace more?

PN8: More so now

PN7: I think the same goes for me (1) I mean we used it during lockdown when we were able to start meeting

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INT: Yeah

PN7: And this is how I kept in touch with my friends and felt like I had some sort of connection with them and yes you can have texts yes you can have phone calls but it doesn't beat seeing somebody

INT: Yeah

PN7: And using this space at that time allowed us to then think OK in the future we don't need to go shopping we don't need to do this we can just meet in a greenspace

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PN8: Yeah that is exactly what I was just going to say that I think previously you'd just go 'oh yeah we'll meet for a coffee and we'll go have a wander round the shops or whatever but actually now I'm just as happy meeting and still having that coffee (2) but having a walk round

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PN7: Yeah

INT: Yeah

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PN8: Somewhere like this or meeting up somewhere further afield that you haven't been too (1) for a walk rather than just doing retail therapy now its more outdoor space therapy

INT: I suppose as well because if its somewhere that is on your doorstep too (1) the accessibility of that is much greater than say (1) I mean the nearest place here would be going into Leeds city centre or something

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PN8: Yeah

INT: Which isn't (1) I suppose the most accessible for (1) everyone whereas this (1) is in walking distance (3)

PN8: Yeah exactly

INT: To lead on from that as well and give you a bit more information (1) so a what a lot of sites like this do and the whole concept of greenspace is to provide some sort of benefit to you (1) it also is a form of flood management which you may or may not of heard about before (1) are sustainable practices or sustainable drainage systems something you have ever heard anything about?

PN7: I have heard about SuDS before but I wouldn't necessarily say I have gone into too much depth about them

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INT: Yes (1) I am trying to (2) if you look in the distance [points to open area in front of participants] you might be able to see the tree planting that has been done near the lake or the smaller pond which could collect water in storm events

PN8: Yeah (2) so are those examples of sustainable drainage?

INT: Yeah so those are some of the methods that can be used in greenspaces like this

PN8: I like that

PN7: I agree (2) I actually live on a floodplain so (1) we have also got greenspaces around us to try and accommodate that but it doesn't always work

INT: Yeah

PN7: Where we are (1) and what we're finding is that even though we are classed as a floodplain (1) they are still building on it

INT: Yeah (1) which is an issue especially as like you've said (1) you live on a floodplain

PN7: Yeah exactly

INT: Do you think the floodplain you live on just provides a form of management for flooding or do you think these areas can provide more benefits than this? Or even at a site like this, do you think it provides multiple functions?

PN8: Well I think I think its good because it provides somewhere that you can meet up with friends and family

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INT: Yeah

PN8: And (1) you know (1) there's various there's different things on this site to keep you occupied you could come for a (2) whole day and you don't necessarily have to spend any money but some of the activities are charged so you are also helping to boost the local economy as well at the same time

INT: Yeah

PN8: So I think its more than just you know like a place where you can only do one thing while you are here (1) there's loads of things to do (1) you can eat here (1) go for walks (1) sit meet up with people (2) so I think its multifunctional (5) one thing (1) its not really linked exactly to what we were just talking about but one thing I have noticed especially (2) at this site is that during lockdown you saw lots of like wildlife and things that maybe normally when you come (1) you've not seen and I think that was partly to do with the fact that there's less pollution during COVID and everything because people were using their vehicles less and things like that

INT: Yeah

PN8: And staying at home and that was nice to see how that made a difference to the space as well and plants that had maybe not flourished before were starting to grow again that was nice to see

INT: Yeah

PN7: Yeah the wildlife thrives more when there's (1) less (2) threats to it

INT: Yeah

PN7: People being a threat to it

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INT: Yeah

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PN8: I think that just shows as well how damaging we as humans can be on the environment (1) I think we have a very positive effect as well (1) on certain things but it just shows that without thinking (1) how damaging we can be

PN7: Because there's less rubbish as well because people weren't around

INT: Yeah

PN7: And that contributes to the drainage not working properly because it gets blocked

INT: Yeah (1) has that had any influence on how you choose to support greenspaces?

PN8: Yeah I think so (1) and I think its also probably to a certain extent (1) made me (2) um (1) complain less about there being parking charges and things like that because I think that (1) in order to provide somewhere like this (2) you also have to understand that that isn't done (1) for free

INT: Yeah

PN8: You know they have to get the money from somewhere

INT: Yeah (1) I suppose with that in mind (1) is there anything that ever puts you off using a greenspace?

PN8: I think if it is just a small charge to get into a space like this I am happy to pay it if I know its going back into the park (1) its nice to know where its going (3) I also get quite bad hay fever (1) I know this isn't the greenspaces fault (1) but it does sometimes put me off visiting if I know I'm going to leave feeling a bit unwell

INT: Yeah (2) that is a really interesting point (1) it must be annoying?

PN8: Yeah (2) I do like to try visit if I know it won't be bad but it can put me off sometimes or make me want to stay inside or visit somewhere else

INT: Yeah

PN7: I am the same in the sense that I am happy to pay a small charge (1) it doesn't put me off as I pay for yearly subscriptions for other greenspaces which allows me with the flexibility to travel to new places depending on what I want to do

INT: Yeah

PN7: Which if anything is a benefit as it gives me something different to see (1) because its important to not become bored with what you are doing (1) so if I have been to the same place a lot (1) I suppose you could say I might be put off in the sense that I'd like to go out a visit a different greenspace instead

INT: Yeah

PN7: You need that stimulation

INT: Yeah

PN7: So I'd be quite happy (1) to pay knowing that it was going to be sustaining the environment

INT: Yeah (1) it makes sense

PN7: It can be nice to know you are supporting places like this too

INT: Of course, you are providing a benefit back to them too I suppose?

PN7: That's a good point (1) yes definitely

INT: And I suppose as we come to the end of our walk (1) is there anything that I haven't maybe mentioned or you would like to talk a bit more about?

PN7: I think there needs to be more facilities for gaining water on your journeys would benefit greenspace and would be useful

INT: Yeah

PN7: And people are less likely to litter and to be more sustainable (1) if you do support those activities (1) of putting in water fountains

INT: Yeah

PN7: It's not that hard (2) most places have got access to water on their land

INT: Yeah

PN7: It wouldn't be difficult to sort

INT: So its more facilities that you'd find useful?

PN7: Yeah

PN8: Yeah that are relatively low cost to instal and maintain (1) but will then encourage people to (3) into the area

INT: I just really want to understand how you use greenspace and what it means to you and I thought a good place to kind of start with it is a bit of an overview of what greenspace is and there's this whole scheme that is being pushed by the government a lot recently that greenspace (1) provides a form of flood management

PN9: Yeah

INT: Yeah so especially where there are floodplains if you have a lot of housing and urban

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PN9: Like hard landscaping and things like that

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INT: Yeah exactly things like that its looking at this whole idea of sustainable practices and there's a solution called sustainable drainage systems or SuDS where they essentially use things like tree planting and having ponds or green roofs to collect water too (2) is this something you have ever heard about before?

PN9: Like green infrastructure too? It is something I am sort of broadly aware of but yeah its not something that I often think about

INT: Yeah exactly you are aware it's a thing but that's the extent that makes complete sense (1) and kind of leading on from that to you (1) what is greenspace?

PN9: Obviously its predominantly parkland so we have a couple of smaller parks near where we live (1) and in terms of what I use them for its probably top of the list walking and dog walking but I do run and cycle as well so parks are more for running and that sort of thing over the gym (1) just because it's a nicer environment and you know (1) going along the main road and that it just sort of gets away from it (1) also I like the fact that you see quite a lot of nature so the animals like the squirrels and birds and so on and the plants too

INT: Yeah there are lots of different things to see and look at (1) how does it make you feel?

PN9: Its pretty relaxing actually (1) yeah

INT: Yeah! Is there anything specific about it or is it just the fact that its outside?

PN9: I think its getting away from traffic which is one thing (1) I guess it probably is the trees and the plants and the birdsong that kind of thing its just a vert relaxing sort of space that you just associate with free time that you're not sat at a desk in an office or in your car

INT: Yeah its like a change of scenery

PN9: Yeah its an escape really (1) you know I find it quite difficult to sit still at home even though we've worked quite hard to make our garden you know a nice space as well there's always something that needs doing and I am one of those people that finds it difficult to sit down and do nothing at home

INT: Yeah that is understandable (1) and would you say you use it for dog walking and running and things like that but are these places somewhere you'd use on your own or with other people?

PN9: It's a bit of a mix really if I'm running its usually on my own but if I've got the dogs its usually with my wife and daughter who come along so yeah a bit of both

INT: Yeah and I suppose with the wellbeing element of it and the link to greenspace which I know s quite person but what is wellbeing to you?

PN9: I think for me its probably that opportunity to decompress a little bit and just to (1) yeah there's always (1) work can be very very busy and stressful sometimes so it can always be a long list of things or people wanting things so I think just having the opportunity to even just walk around the park at lunchtime is an opportunity to get away from that and it's a bit of me time (1) so that can be it (1) it think (1) I used to play in the woodlands a lot

INT: Yeah so its almost like nostalgic to an extent?

PN9: Yeah exactly just getting out the house and doing stuff is really refreshing (1) with us all on our phones too it's a good opportunity to just step away from them and do something outside and interactive with people

INT: Yeah and wellbeing like you said it can be influenced by lots of different things but I suppose in relation to greenspace (1) would you say your mental or physical health has been influenced by greenspace?

PN9: Its difficult to say in my case (1) there's also a strong correlation between (1) a just being outside and b physical exercise improving your wellbeing as well and I tend to blend them all together so yeah its difficult to tell about them in isolation but if I just look at them from how I use greenspace at a lunchtime and where I sit on a bench and just watch the world go by (1) yeah I can definitely see how it could improve my health like I said it is definitely a way of decompressing

INT: Yeah and like you said its quite difficult to separate all these things out because you could argue that if you went on a walk it could improve your mental health or visa-versa or you could not find any benefit either form these things

PN9: Yeah exactly

INT: Yeah and you may feel really good or really bad as a result of it (1) do you think there are any negatives or things that put you off using greenspace?

PN9: The only thing I can really think of is (1) during the winter when its dark in the evening (1) you know (1) a lot of nearby parks are not lit and there's no street lighting or anything like that so (2) it can (1) it can be a little bit intimidating particularly if you are on your own in a space like that (2) and (1) I can't really think of much else (1) other than (1) you know if there was some antisocial behaviour maybe going on (1) that would stop me being able to relax not because I would feel threatened particularly by it is more just that that (1) it annoys me more than anything else

INT: Yeah that's completely understandable (1) you don't go out to somewhere like this to see things like that

PN9: Yeah exactly yeah and even if its not happening when you're there you can still see the aftermath of antisocial behaviour you know that can be distressing as well (1) you know if there are cans and things that disrupt wildlife and nature and things like that and vandalism and stuff like that

INT: Yeah I understand (1) it can change your thoughts on a space

PN9: Yeah its not the nicest thing to see and while its not the spaces fault or anything its not what you really want to be seeing

INT: Yeah that's understandable

PN9: But that's it really (1) I can't think of anything else I want too add