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The role of managed natural spaces in connecting people with urban nature: a comparison of local user, researcher, and provider views

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Abstract

Increasing evidence of the health and wellbeing benefits of urban natural spaces has resulted in policy goals to increase their use. Making these spaces accessible and attractive to potential users is fundamental to achieving these goals since a mismatch between design and use can mean that the potential benefits of these spaces are not fully realised. Yet there has been limited investigation of whether the ambitions of providers align with local user preferences. Using a qualitative approach, we combined interviews of providers and researchers with focus groups of local users to reflect on the provision and use of urban natural spaces in the UK, and analysed the resulting transcripts using framework analysis. Three overarching themes were identified: (i) the role of managed environments in connecting people with nature; (ii) built features as facilitators of connection with nature; and (iii) challenges to connecting with nature arising from built features and the management of natural spaces. Although there were points of agreement between the stakeholder groups, we identified some key differences. Local users expressed a preference for both wilder and more formal urban natural spaces and opposed the removal of built features significant to the local history of the area. Whilst researchers recognised these views, providers were not aware of local user preferences for wilder spaces or the extent that local users considered the local heritage and its artefacts important. Understanding these differing perspectives on local natural spaces is important for maximising the value of these spaces to provide co-benefits for the environment and health.

Keywords Urban nature · Green space management · Landscape perception · Stakeholders · Qualitative research

Introduction

Over 80% of the UK population lives in urban areas, a pattern in line with other high-income countries (World Bank 2016). 'Natural' spaces in urban areas, which include green and blue space, provide residents with everyday nature experience and the opportunity to connect with nature (Dunn et al. 2006; Palliwoda et al. 2017). The health benefits of these spaces are increasingly recognised (Soga and Gaston 2016; Mell 2017). There is evidence that people exercise more in parks

with greater biodiversity (Lovell et al. 2014), and that visiting spaces that are, or are perceived to be, more biodiverse, is beneficial for mental health (Fuller et al. 2007; Luck et al. 2011). Whilst few countries have national policies to increase opportunities for people to visit natural spaces, many implement policies at regional, city or local level (Mell 2017; Ten Brink et al. 2016). However, despite these ambitions, the last 20 years has seen an increasing disconnection of people from nature in many countries (Soga and Gaston 2016).

Increasing nature experience in the UK

In the UK, the National Planning Policy Framework highlights the importance of green space and places the responsibility for incorporating green infrastructure into built developments with local authorities (Department for Communities and Local Government 2011). Many local authorities set minimum targets for quantity of green space in the living environment (Bristol City Council 2008).

However, almost 10% of the UK population do not visit the natural environment at all and, of those who do use natural

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spaces, visits by 32% of the population account for 75% of time spent in nature (Cox et al. 2017; Natural England 2015). Providers, both those involved at the strategic level in policy or planning and those implementing changes and managing sites, face the challenge of providing urban natural spaces that facilitate interaction by the public and enable users to realise the potential benefits of using green space (Riechers et al. 2016; Ten Brink et al. 2016). Finding solutions to this challenge requires understanding people's views on urban natural spaces, so they can be designed to be attractive and provide a comfortable user experience, to help people engage with urban nature in the most beneficial manner (Colleony et al. 2017). Without an understanding of user preferences, spaces may be provided which do not meet local user needs (Riechers et al. 2016). Indeed, the low use of many green spaces suggests that, more often than not, what is provided by these spaces, whether in terms of accessibility, characteristics or facilities, does not meet expectations.

Comparisons between views of users and providers of urban natural spaces

Recent reviews of biodiversity preferences and urban park use have found that the aesthetic appearance of urban natural space is more important to the majority of users than high levels of biodiversity (Botzat et al. 2016; McCormack et al. 2010). Within these spaces, people enjoy seeing focal landscape features such as water as well as wildlife and plants, particularly trees and colourful displays of flowers (Botzat et al. 2016; McCormack et al. 2010). Whilst people expect rural nature to be natural, they have different expectations of urban natural spaces (Cooper et al. 2017). Within urban areas, people prefer spaces which are well maintained and contain amenities such as paths, seating, toilets, and play equipment (McCormack et al. 2010). They are also more likely to visit relatively open landscapes without dense vegetation, as they feel safer in areas with high visibility (Qiu et al. 2013). Bertram and Rehdanz (2015) found park visitors considered a park's cleanliness a more important characteristic than the 'naturalness' of its appearance.

There have been a range of studies into landscape preferences but when we searched the literature for studies comparing the views of users with other stakeholders regarding natural spaces, we found few studies. The small pool of multi-stakeholder studies are predominantly quantitative. Dunstan et al. (2005) evaluated a tool for assessing neighbourhood quality by comparing scores given by independent assessors and local residents, finding it reliable apart from its assessment of green space quality. Other quantitative studies have asked participants to rate photographs of different natural landscapes. These suggest that local users and other stakeholders have similar preferences, differing only regarding certain elements in these spaces, with ecology students found to be more

tolerant of natural processes such as decay (Qiu et al. 2013), and providers and researchers placing more value on rare species and less value on aesthetics than local users (Tempesta and Vecchiato 2015). In their quantitative study, Hofmann et al. (2012) found that, whilst strategic providers involved in landscape planning preferred 'natural' green spaces, local users would rather visit more formal or artificial spaces. A study tracking eye movements as participants looked at photographs showed that local users, providers, and researchers view landscapes differently which may explain their different perceptions (Dupont et al. 2015). However, another quantitative survey of providers found preferences for formal and natural spaces also varied between groups of providers, with conservation trusts preferring more natural landscapes, and local authorities and landscape planners believing these should co-exist with more formal landscapes in urban settings (Özgüner et al. 2007).

These studies point to differences in the views of local users and other stakeholders; however, they shed less light on the reasons for these differences. Individuals' preferences in natural spaces are influenced by a wide range of subjective factors, including the value they place on nature, their experiences in natural spaces, and relational values, such as the contribution of people's relationships with nature to their cultural and individual identity (Chan et al. 2016; Cooper et al. 2017). For local users, place attachment, the emotional connection they have to their local environment and the sense of well-being derived from its continuity over time (Wolf et al. 2014; Zhang et al. 2015), is a significant factor in determining their preferences and attitudes towards management (Davenport and Anderson 2005). Providers do not necessarily have this emotional attachment (Riechers et al. 2016). Their knowledge regarding the management and environmental characteristics of these spaces may influence their preferences (Hofmann et al. 2012), as well as the demands involved in management (Özgüner et al. 2007).

Understanding these different factors is important in order to ensure the management of urban natural spaces is aligned to meet user needs. Qualitative study designs allow exploration of the reasons for differences in the preferences of local users and other stakeholders, giving a nuanced insight into meanings attached to the natural environment that cannot be obtained from quantitative studies (Gill et al. 2008), and contributing to a deeper appreciation of the individual and societal benefits of these spaces (Chan et al. 2016). For example, a recent qualitative study of scientists and local users found that, although the two groups shared similar emotional responses to nature, scientists had more objective knowledge which influenced their preferences (Prévot et al. 2016). Another showed that local users place value on aesthetics and enjoyment of nature in natural spaces, whereas providers, both strategic providers and implementers, have a more utilitarian view of nature as they have to balance a number of environmental and

social factors in the management of these areas (Riechers et al. 2016).

User preferences for urban natural spaces are often very closely linked with the characteristics of the space itself and, as users tend to use just one or a few urban natural spaces, focusing on a specific area allows exploration of local level factors such as place attachment and their importance in determining user preferences (Davenport and Anderson 2005). However, the context in which providers make decisions will be much broader than this, and management is often the responsibility of providers who have little direct engagement with individual spaces at a local level and responsibility for making decisions across a number of sites (Tempesta and Vecchiato 2015). Studies comparing the views of stakeholder groups regarding protected areas in Italy (Tempesta and Vecchiato 2015), and the Czech Republic and Republic of Macedonia (Petrova et al. 2011) have sought the views of both local users and stakeholders from a wider context. Hence, broadening the sample of providers to include providers and researchers from the national level takes into account the wider context in which the management of natural spaces takes place (Petrova et al. 2011).

In this study, we therefore sought the views of local users of a specific case study natural urban space and contrasted them with the views of providers and researchers from across the UK. Using a qualitative approach enabled users and wider stakeholders to express their views and experiences in their own words, giving greater depth and insight into the factors influencing their views and preferences.

Objectives

This study investigates similarities and differences in the views of four stakeholder groups regarding the management of urban natural spaces. The groups are local users, researchers providing evidence on preferences in natural environments, and providers, both strategic providers and implementers involved with the management of urban natural spaces. Specifically, views were sought on the following questions:

(i) How should urban natural spaces be managed to encourage interaction of local users with nature?
(ii) What is the role of built features in urban natural spaces in encouraging interaction with nature?

Case study

The study is part of an investigation of the ecological restoration of an urban river in a major UK city. The Medlock is located in Manchester, a city with a population of 2.5 million, in what was once an area of heavy industry. It was culverted in the late 1880s and a section of the river was then restored over a nine-month period from autumn 2013 to spring 2014 with the aim of improving the environmental health of the river and increasing access for local residents. The Medlock flows through two urban green spaces accessible to the public, the restored section is located in Clayton Vale, and an unrestored section of the Medlock flows through Philips Park. The river Irk flows through a similar area of Manchester to the Medlock including two areas of accessible green space, Queen's Park and Blackley Forest, but has not been restored, so serves as a comparison to the Medlock.

Methods

Study design

We used a mixed methods design, using focus groups for local users of green spaces around the Medlock and Irk and interviews for researchers and providers. Focus groups can facilitate participation by those who may find the interview format off-putting (Kitzinger 1995), while researchers and providers can be more comfortable in the 1:1 format of an interview (Gill et al. 2008).

Data collection

Focus groups with local users

Focus group discussions were conducted with users of the four natural spaces – Clayton Vale, Philips Park, Queen's Park and Blackley Forest - surrounding the restored river and unrestored river. Participants were recruited from local groups: three of the natural spaces around the rivers have regular walking groups which were contacted, as were the community groups associated with these areas including the Friends of Clayton Vale, the Friends of Philips Park, the Friends of Blackley Forest, and the Big Local initiative at Queen's Park. Posters were displayed on the park noticeboards at all of the green spaces and posters and flyers advertising the focus groups were left at local venues including corner shops, libraries, and community centres. Focus groups were conducted until data were collected from users of all four green spaces around the restored and unrestored rivers.

The focus groups began with a discussion of how often participants visited the parks, areas they liked and disliked, and their reasons for visiting. Photo-elicitation techniques were then used to prompt discussion (Harper 2002). A range of photograph sets were used; these pictures displayed spaces

with a dominant natural characteristic such as water, trees, or flowers, in either a more formal or more natural management regime. A set of photos of the river Medlock, before, during and after restoration, along with a picture of an unrestored downstream section of the river Medlock, were also shown. The discussion was centred on the spaces people would prefer to visit if they were visiting a natural environment for either exercise or relaxation and the importance of nature to their visit. The presence of water, its importance, and how it made people feel when visiting a natural space, was also discussed (see the supplementary information for the focus group protocol).

Interviews with experts

Interviews were conducted initially with local providers and researchers and then extended to gain a wider UK perspective. The pool from which researchers and providers were recruited reflects the range of organisations involved in the management of green spaces. In the UK, there are 36 metropolitan councils and 55 unitary councils (excluding London boroughs) who between them provide local services in urban areas in the UK and therefore have responsibilities regarding the provision of natural spaces (Ministry of Housing, Communities, and Local Government 2016). Other organisations involved in the management of urban natural spaces include those associated with the government such as the Environment Agency, Natural England, and the Forestry Commission, and charities or community groups. There are many local examples of these groups, but nationally they include the Wildlife Trusts, of which there are 47 managing 2,300 nature reserves across the UK (The Wildlife Trusts 2017). The majority of research on preferences in natural spaces comes from the academic community, from disciplines including urban planning and environmental science.

The sample was recruited to contain representatives of the research community (academics and senior members of research organisations), who provide evidence on preferences in urban natural spaces, and providers, who are responsible for the provision of these spaces. Providers included those involved in implementation, who might manage natural spaces or have responsibility for delivering restoration initiatives (e.g. city council, Wildlife Trust, and agency project managers), and those with a strategic role, with responsibilities regarding green space provision at a wider scale (e.g. Directors of Public Health and strategy managers). As the interviews were intended to be informed by the participants' field of work, purposive sampling was used to obtain a range of views, the aim being to recruit the maximum variety of participants (Riechers et al. 2016; Ruskule et al. 2013). Additional participants were recruited and interviewed until data saturation was

achieved and additional interviews did not lead to additional emergent themes (Guest et al. 2006).

Interviews were conducted either face-to-face or over the telephone. The interviews were semi-structured around key topics (Box 1); see the supplementary information for the full interview protocol. Photographs of the restoration, as shown in the focus groups, were used to facilitate discussion, as were quotes from the focus groups and data regarding the ecological impact of the restoration.

Study participants

The overall sample (n = 44), included 12 local users and 32 providers and researchers.

Five focus group discussions, lasting between 20 min and one hour 40 min, were conducted during October 2015; two with users of the restored river, and three with users of the unrestored river. Of the 12 participants, 10 were female and 2 male, and all were 45 years or older. Half had lived in the area all their lives, four for more than five years, and two between one and five years.

Thirty-two interviews were conducted between July and November 2016; each interview lasted between 20 min and one hour. Participants included 8 researchers, 12 implementation providers, and 12 strategic providers (Table 1).

Analysis

All focus groups and interviews were audio-recorded and fully transcribed. The transcripts were analysed using framework analysis, an increasingly-used method of qualitative analysis (Ritchie and Spencer 2002; Srivastava and Thomson 2009). Framework analysis is a systematic method of analysing qualitative data with five distinct stages: familiarisation with the

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Box 1 Guide to topics covered in the interview

- Appearance and characteristics of an ecologically healthy urban natural space
- Interactions by local people with urban natural spaces
- The impact of ecological health on people's interactions with urban natural spaces
- Perceptions of the benefits of urban natural spaces for human health and well-being
- Discussion of the ecological restoration of the Medlock and its ecological impact (using pictures of the restoration and ecological data)
- Discussion of the ecological restoration of the Medlock and its social impact (using pictures of the restoration and quotes from the focus groups)
- Compatibility of nature conservation in urban natural spaces and their use by local people

Table 1 Details of interviewees

	Organisation
Researchers	Academic (7); government agency (1)
Implementers	Local authority (2); conservation trust (3); government agency (4); healthcare provider (3)
Strategic providers	Academic (1); conservation trust (3); government agency (1); local authority (4); utility company (3)

data set; development of a framework; coding; charting the data; and interpretation. The resulting structured output can be used to make comparisons both within and between groups of participants (Pope et al. 2007; Finlay et al. 2015). It is a form of thematic analysis, in that patterns are identified in the data, but is not associated with any particular epistemological or theoretical approach, making it an adaptable method of analysis (Gale et al. 2013). The structured outputs derived from the analysis let others review the data, increasing the transparency of the findings (Furber 2010).

A two-stage framework analysis was carried out as in Furber and McGowan (2011). The first stage involved the separate analysis of the focus groups and interviews. After familiarisation with the dataset, an initial thematic framework was constructed for each dataset. An inductive approach was adopted using thematic analysis techniques (Braun and Clarke 2006); themes were identified from the data rather than being taken from existing literature. Themes were cross-checked between authors and the two frameworks were then applied to their corresponding data sets. Text was coded in paragraphs to place each quote in context (Finlay et al. 2015). The transcripts were coded in NVivo 11.

Once completed, the common emergent themes between the two data sets were identified and a second framework analysis was undertaken. The management of the natural environment and the role of built features were major topics of discussion in the focus groups and interviews so a thematic framework encompassing these issues was developed and applied to both data sets. This was followed by charting, with data relating to each participant being organised and summarised by theme allowing interpretation of the data (Ritchie and Spencer 2002). Responses were compared within each theme in order to understand similarities and differences in the views of different groups of participants.

Results

Three overarching themes were identified regarding the role of the built environment and management of urban natural spaces in facilitating connection with nature (summarised in Table 2). The themes were (i) the role of managed environments in connecting people with nature; (ii) built features as facilitators of connection with nature; and (iii) challenges to connecting with nature arising from built features and the

management of natural spaces. The views of local users (LU), providers – strategic (PS) and implementers (PI) - and researchers (R) in relation to these three themes are compared and contrasted below. Strategic providers and implementers are referred to as providers apart from where the two groups express different views. Our sample contained researchers and providers recruited locally and nationally, no differences were found in the views of stakeholders from these different contexts.

Theme 1: The role of managed environments in connecting people with nature

Local users commented that nature in urban areas should be accessible and expressed displeasure that nature they want to access 'is all fenced off' (LU1) and that 'they're building more up here now so there's going to be no green space' (LU4).

Providers highlighted the importance of providing access to natural spaces in urban areas to give people a place to interact with nature. Similarly, researchers emphasised that people need access to natural spaces in urban areas so they see nature as part of their everyday lives: 'you don't want people to think that they have to leave the city to experience nature' (R1). For implementers, the provision of this space mattered more than its quality: 'some of that space where that interaction might happen might not be the most natural bit of river but you've made sure it's safe enough for people to go and [play]' (PI3).

Providers and researchers considered that people prefer spaces with the appearance of management and do not perceive ecological health, but that they appreciate managed space as it shows the space is valued: 'I don't think the average person thinks anything about it beyond it looking well maintained and looked after' (R1). Implementers agreed that 'if you see something that has been restored or cared for, you can interpret it as a valuable space' (PI8) as did strategic providers: 'there's something about it being looked after and cared for which I think goes back to that bit about connection really around place, looking after your place' (PS6).

Providers felt that, because people value more managed spaces, they are more likely to feel comfortable and connect to nature in these areas: 'you could probably tidy a river up and mow the banks and have it nice and neat and straight, and still do a project that delivered lots of health and well-being benefits in terms of putting in a path and getting people

Table 2 Summary of the views of local users, researchers, and providers for each theme

Theme	Local users	Researchers	Implementers	Strategic providers
The role of managed environments in connecting people with nature	People want access to natural space in urban areas. Some users prefer, and connect to nature, in more managed environments, some prefer wilder natural spaces. Individuals connected with nature in spaces in which they were comfortable. Connecting with nature was a reason for becoming involved with volunteer management.	Access to natural space in urban areas is important for local users. Local user preferences' in natural spaces are dependent on the individual. People are more likely to connect with nature in spaces in which they feel comfortable; these may be wild or more managed. Managing urban natural spaces for nature exposes people to nature and therefore facilitates connection with nature. Volunteering encourages people to connect with nature.	Access to natural space in urban areas is important for local users. Local users prefer natural spaces with the appearance of management and are more likely to feel comfortable and connect with nature in these spaces. Managing urban natural spaces for nature exposes people to nature and therefore facilitates connection with nature. Volunteering encourages people to connect with nature.	Access to natural space in urban areas is important for local users. Local users prefer natural spaces with the appearance of management and are more likely to feel comfortable and connect with nature in these spaces. Volunteering encourages people to connect with nature.
Built features as facilitators of connection with nature	Built features add value to natural spaces, are important in increasing their accessibility, and allow people to come into contact with nature. Built features are seen as part of the natural environment. Built features contribute to people's sense of place.	Built features add value to natural spaces, are important in increasing their accessibility, and allow people to come into contact with nature. Built features contribute to people's sense of place.	Built features add value to natural spaces, are important in increasing their accessibility, and allow people to come into contact with nature. Built features are seen as part of the natural environment and can enhance experiences of the space. Built features can facilitate connection with nature by making people feel safe in natural spaces.	Built features add value to natural spaces, are important in increasing their accessibility, and allow people to come into contact with nature. Built features are seen as part of the natural environment (negative).
Challenges to connecting with nature arising from built features and management	Removal of built features which are part of cultural heritage disrupts sense of place. Built features and lack of management, particularly resulting in a poor appearance, lead to negative perceptions of the space and mean it is hard to use. Lack of provision of wilder natural spaces means some local users do not have spaces in which they can connect with nature. Management for nature can mean people do not feel safe using natural spaces.	Built features which are part of cultural heritage and contribute to sense of place should be kept in urban areas if possible. Built features and lack of management, particularly resulting in a poor appearance, lead to negative perceptions of the space and mean it is hard to use. Assumption that users do not want wilder natural spaces means some do not have spaces in which they can connect with nature. Management for nature can mean people do not feel safe using natural spaces.	Built features which are part of cultural heritage and contribute to sense of place should be kept in urban areas if possible. Built features and lack of management, particularly resulting in a poor appearance, lead to negative perceptions of the space and mean it is hard to use. Local users do not recognise more ecologically healthy spaces. Management for nature can mean people do not feel safe using natural spaces.	Built features which are part of cultural heritage and contribute to sense of place should be kept in urban areas if possible. Built features and lack of management, particularly resulting in a poor appearance, lead to negative perceptions of the space and mean it is hard to use. Urban natural spaces are managed for local users not nature. They are of poor quality due to the surrounding urban environment. Management for nature can mean people do not feel safe using natural spaces.

running in the outdoors and seeing flowers' (PI3). In contrast, whilst researchers agreed that people connect with nature in spaces in which they feel comfortable, this did not require managed space as it would be different for different people: *'quality and aesthetics are quite sort of personal and they depend on what you're used to and what your history is' (R7).*

Connecting with nature in spaces in which they felt comfortable was discussed by local users in the context of the different preferences people have for formality or naturalness in urban natural spaces. Views were varied. Some preferred formal parks, as they felt that the definition of a park implies management: *'where the park I think they just like to be a little bit more…regimented' (LU1),* whereas others preferred wild spaces: *'I don't like it too landscaped, I don't like it too pretty and perfect, and I like nature to be nature' (LU2).*

Local users, implementers, and researchers felt that managing urban natural spaces to enhance nature could facilitate connection with nature. Local users who preferred natural areas said they were more likely to visit these spaces when *'it looks like a more interesting landscape, it looks a bit wilder, if I was going to visit somewhere that might be a nicer place to walk round' (LU12).* Similarly implementers emphasised the importance of nature in enhancing people's experience of the space: *'the more naturalised it is, the better…to give you a kind of feeling of being removed from your normal surroundings, I think is really beneficial' (PI11).* Implementers and researchers agreed that managing spaces for nature was an opportunity to expose a wide range of people to nature: *'those areas of grass offer blank canvases for us to be able to do some very innovative conservation work…adding an educational aspect, an engagement aspect [for] people who might not necessarily escape the boundary of their city' (R3).*

Although not discussed by local users, providers and researchers also mentioned opportunities to manage the wider urban environment to lead to incidental connection with nature: *'one of the things the city owns and manages is a massive acreage of highway verge…they're all just manicured…if we could make [these] changes…everybody driving into [the city] would suddenly be welcomed by seasonal wildflower displays, which again would reconnect people to that whole thing of, actually, it is April, or it is July'(PS5).*

All groups noted that participation in the management of urban natural spaces can help connect local users with nature. Nature was a motivating factor for volunteering: *'that's one of the reasons why I joined [the Friends of group] anyway…to encourage…the wildlife' (LU9).* Local users also emphasised the importance of volunteering as *'it makes you feel as though you're part of something and you're giving something back' (LU8).*

This feeling of 'giving something back' was discussed by researchers; *'older people sometimes…when they've retired… feel like they have time to give something back' (R5).* Similarly, strategic providers commented that, by being involved in the management of the space, local users *'begin to understand the issues involved, they have some sort of local ownership' (PS7)* and that participation in management can facilitate user engagement with nature: *'the local community have built [a sustainable urban drainage system]…and they're engaging with it, and…there is that health and well-being aspect to it, and understanding and engaging in nature and valuing nature' (PS7).*

Theme 2: Built features as facilitators of connection with nature

All groups discussed manmade structures in urban natural spaces. The most commonly-mentioned features were park amenities such as paths, benches, and playgrounds. Others built features included artificial river channels, dams, or weirs.

All groups considered that built features aided appreciation and enjoyment of natural spaces. Local users spoke about features which enhanced their experiences, such as playground equipment as '*I take the grandkids so that they can play in the park' (LU1).* Similarly, researchers mentioned how built features added value to sites, for example *'some industrial mining sites…they have kind of tried to, you know, create interpretation sculpture that kind of links to that industrial heritage' (R5).* Providers and researchers both noted that built features can aid connection with nature through nature education: *'interpretation [boards] for the general public so they can see what's going on and understand it' (PI10),* but local users did not discuss interpretation boards.

All groups commented that built features facilitated connection with nature by making natural spaces accessible. Local users emphasised the importance of paths so that *'it's no restriction to…anybody in a wheelchair' (LU2).* Paths were seen by providers and researchers to encourage people, especially more casual users, to visit natural spaces: *'[who] we want to encourage to use these facilities, it is the more casual user, who you know isn't going to get dressed up in their hiking boots to go out for half an hour' (PS4).* They enabled users to know where they can go, and therefore made them more comfortable using the space. Other built features highlighted by local users as facilitating access included: *'benches… [so] the elderly can go maybe walk through with their grandchildren'(LU5)* and *'some form of shelter…not a proper structure but…with our weather….half the time it's just a quick shower and you could stay there'(LU4).*

Local users also considered built features important in creating contact with nature: *'when I'm having a bit of a stressful day, I'll go there and sit on the benches and just…listen to the birds' (LU7).* Similarly, implementers commented *'you've been increasing human contact with nature there with the creation of a footpath along here' (PI4)* and researchers suggested that *'people will like walking along that kind of place*

[path], and you know, people who are interested in species, it gives them an opportunity to go and observe things' (R1).

Built features that related to past industry were seen by many local users as part of the history of the area: 'that red brick is part of our history' (LU2); and were important to local users in contributing to their sense of place. Researchers remarked on the importance of these features for people's sense of place, for example 'in Sheffield…there's old mill workings and stuff which once they've grown over with habitat are actually very attractive and I think that's of importance to maintain that for people's sense of place'(R6). Implementers noted that, because they made people feel comfortable within a natural space, they could help people connect with nature 'I think for some people that historical aspect is important…. maybe in an urban setting if you want to introduce people in a safe way to nature…then that's appropriate' (PI4).

Local users and providers both felt that built features are seen as part of the natural environment in natural spaces. Local users commenting on the unrestored Philips Park said 'when you think about it, [it's] not very natural looking but it was something you'd always seen so you didn't really think about it' (LU9). Providers felt that this could contribute to people's experience, for example 'even though that's a completely manmade noise, they [local users] still really like that louder sort of gushing noise of the water going over the weir' (PI2). However, this was sometimes seen as negative by strategic providers: 'let's be uncharitable and say that's a 50% entirely artificial environment, that would probably meet a lot of people's aspirations as much as the nicest piece of semi-natural woodland or old meadow or rich pond or something decent' (PS3).

Theme 3: Challenges to connecting with nature arising from the built environment and management

All groups highlighted potential challenges to connecting with nature arising from the management of natural spaces. Challenges included the removal of built features relating to cultural heritage, and various issues surrounding management such as lack of management and management with the assumption that local users did not want natural spaces.

Local users felt the removal of built features in order to restore nature was a challenge to connecting with nature as it disrupted their sense of place: 'and we don't want it ripping out, we said, alright maybe…bring it back…but you must keep some of [it] because it's part of the history of Philips Park, it's part of the history of Clayton' (LU1). In some cases local users felt the cultural heritage should be kept despite the impact on environmental health 'the industry is part of its heritage… although we moan about it and about the quality of the water…I'm not sure it's as much of an issue… I find looking at the water quite pleasant even though I might not want to get in it '(LU12). In contrast, providers felt these features should be

removed if they were having a negative environmental impact, especially if this might be harmful to human health: 'if it's contaminated in some sort of way then just because it's our history…' (PS6). However, providers and researchers agreed that, in urban areas especially, if these features were important for people's sense of place they should be integrated into the design of urban natural space where possible.

In some cases, built features prevented people connecting with nature by creating negative views of the natural environment. Some built features had negative associations for local users: 'that [brick-lined river channel] looks more like…a sewer' (LU4). Similarly, providers commented that: 'they [canalised rivers] might be functional, but they look horrible, and people don't engage with them' (PS7). Researchers felt that aesthetically unpleasant places are used less: 'if the local bit of river near your house is slightly intimidating and it's got concrete sides and smells a bit wrong, you're less inclined to want to go and run alongside it or take your kids down there or sit and enjoy the scenery'(R8).

Poor management was another issue seen to lead to negative views of the natural environment. This is because it makes the space unappealing to visit, for example, if 'the pond is full of trolleys or bike pieces' (LU2), and difficult to use: 'you wouldn't go down [there] because it's that thick and y'know, the leaves and everything, you'd end up slipping in it' (LU1). Providers and researchers agreed that people did not interact with spaces which had poor appearance: 'people would probably actively avoid areas that they felt were depleted or stagnant' (PI3). They also felt that people did not value these spaces: 'if you've got sort of bubbling greywater, to give an extreme example, full of litter, people really won't want to engage with it and won't value it' (PS7).

However, some providers thought that over-management of urban natural spaces was challenge to connecting with nature: 'they [urban parks] are very poor environmental quality, so you don't get people interacting with them in the same way, viewing them in the same way, or even, even seeing them as nature, because they're so urbanised, they're just a reflection of the urban environment' (PS5). Others considered that there was no other way of managing urban space in ways that met the needs of local people 'if you are short generally of any green space…it becomes a problem, if you for example would have to choose that little square… can be used for pushing a ball around and pushing a buggy around or whether you say "oh no it needs to all be wild and nobody can access it because we disturb the nature"' (PS1).

Local users differed on whether under- or over-management was a challenge in connecting to nature. Commenting on more formal environments, some felt '[I] wouldn't know what to do with it' (LU9) but others considered more natural spaces did not belong in urban setting: 'that one would be nice but not in a park' (LU1). Providers felt that people did not recognise the difference between ecologically

healthy and unhealthy spaces: *'I'm not sure if the general public would see beyond it being a field. I'm not sure if the dog walkers at [an urban nature reserve] necessarily recognise the natural, you know, the ecological value of it, or whether they just see it as a bit of green space'* (PI11), which is why spaces are often managed on the assumption that people do not value nature. Some researchers considered that providers assumed people did not want natural spaces: *'what the council think people want is large expanses of short mown grass, a scattering of trees, and a canalised river running through it'* (R3).

Some local users noted that concerns about personal safety in wilder natural spaces created a challenge to connecting with nature: *'they had big leaves y'know that shaded…these big leaves…anybody could have been [behind]'* (LU1). This need for safety was recognised by providers and researchers: *'I think probably there's a balance somewhere – you know, ecologically healthy, but probably not with a great diversity of species, partly because…a more sort of natural wild space, you know, the edges of the river might not be quite so clear, they might be perceived to be a bit dangerous to some user groups'* (R1).

Discussion

Because we were interested in the perspectives of different groups of stakeholders, we took a qualitative approach, allowing study participants to express their views and talk about their experiences in their own words. Samples sizes in qualitative research are generally smaller than in quantitative research, because of their focus on subjective meanings and because data saturation is typically reached at smaller sample sizes (Guest et al. 2006; Pope et al. 2007). In their qualitative systematic review of local user preferences in parks, McCormack et al. (2010) found that the number of participants in studies ranged from 11 to 132. Although on the smaller end of the scale, our samples fall within this range and are comparable to both qualitative studies of preferences in natural environments and studies using framework analysis (eg. Finlay et al. 2015; Furber and McGowan 2011; Riechers et al. 2016).

Our results showed that local users, researchers, and providers agreed that managed natural spaces and built features could be valuable in aiding connection with nature in urban areas (Table 2). However, their views differed concerning certain key issues (Table 2).

The discussion highlights three issues regarding these findings.

Increasing opportunities for nature experience

The importance of the provision of urban natural space was emphasised by all stakeholder groups. Current UK policy aims to improve green infrastructure in urban areas (Department for Communities and Local Government 2011) and providers, particularly those involved at a strategic level, were aware of the needs of local users regarding green space provision.

Involvement in management can facilitate connection with nature: local users felt that volunteering was important and providers and researchers agreed that it could increase interaction with nature. Studies have noted the role of volunteer work in obtaining benefits from nature (Husk et al. 2013), as well as the educational potential of natural spaces (Shanahan et al. 2015). Whilst researchers and providers emphasised the importance of built features such as information boards in educating and engaging people with nature, local users did not discuss education in urban natural spaces. This highlights the importance of local knowledge regarding user preferences. It also suggests that providing opportunities for active engagement with natural spaces is more important to local users than passive methods such as providing information.

The management of urban natural spaces

The largest difference between stakeholder groups was regarding the degree of naturalness or formality in urban natural spaces. Previous quantitative studies comparing the views of providers and local users found that providers and researchers tend to prefer spaces which are wilder and more biodiverse than local users (Hofmann et al. 2012; Qiu et al. 2013; Tempesta and Vecchiato 2015). However, people's connection with nature, and preferences in natural spaces, are subjective and dependent on the individual (Fish et al. 2016), and accordingly we found local users had preferences for both formal and wilder urban natural spaces. Whilst researchers acknowledged these different preferences, providers felt that local users wanted formal managed spaces. Our findings suggest that providers are aware that their preferences do not match with those of local users so do not appreciate the range of preferences held by the public.

That providers favour formal natural spaces is an issue because, for many people in urban environments, these spaces are their only means of experiencing nature (Dunn et al. 2006). Studies suggest that visiting rural natural spaces leads to biodiversity exposure and increases support for conservation but this does not happen after visiting less biodiverse urban spaces (Coldwell and Evans 2017). Whilst the loss of biodiversity and human pressures in urban environments means that these areas will never be in pristine ecological health, it is possible to increase their biodiversity (Botzat et al. 2016). Our study indicates a clear need for the provision of spaces which are managed for nature, for users wishing to enjoy more natural environments, and to ensure that urban residents are exposed to areas of high biodiversity.

Whilst researchers, implementers, and local users agreed that management for nature in urban natural spaces can

facilitate connection with nature, they felt that management for nature is not always compatible with factors such as the need for safety in urban environments. Users generally accept wilder spaces as long as there is the minimum of access and some elements that suggest human influence as this gives a 'cue to care' (Hofmann et al. 2012). This suggests that parks could be managed to encourage human-biodiversity interaction, for example through planting species-rich meadows and edible plants (Palliwoda et al. 2017), as long as features such as paths are present.

The role of built features in natural spaces

Providers appear to be aware of local user needs regarding built features in urban natural spaces. All groups emphasised the importance of built features in facilitating interaction with nature, highlighting the role of paths and benches in allowing sensory experiences of nature. Built features in urban natural spaces were also considered important by all groups as they increase the value and accessibility of these spaces. Unlike rural nature, people expect urban environments to have amenities (Cooper et al. 2017), perhaps because they are places for everyday use. Studies show that paths and other facilities allow a range of user groups to visit natural spaces, particularly older people, those with mobility issues, and those with small children (Finlay et al. 2015; Schipperijn et al. 2010).

Built features which relate to cultural and historical heritage are considered important in urban natural spaces because they contribute to people's sense of place (Pietrzyk-Kaszyńska et al. 2017) and we found that researchers and providers were aware of the importance of these features to local users. However, whilst local users were opposed to changes in their local environment, providers and researchers felt these features should be removed if they were environmentally damaging. This difference in views may be explained by the concept of relational values, which concern people's relationships with or involving nature (Chan et al. 2016). Implementers do not have the same relationship with these built features as local users and therefore may not value them in the same way. Whilst not every urban natural space will have a cultural heritage, there may be specific features which are important to people, indicating a potential for conflict. This underlines the importance of site-specific management and the involvement of communities in decisions regarding natural spaces (Pietrzyk-Kaszyńska et al. 2017).

Strengths and limitations

Our sample of researchers and providers were recruited from a range of backgrounds and organisations across the UK. Whilst most did not have specific knowledge of the case study area, they gave a national viewpoint on the management of urban natural spaces. The views of local providers and researchers did not differ from those recruited nationally, indicating that different factors influence the views of stakeholders and local users.

The users were drawn from the deprived areas which formed the site of the case study. Recruiting participants from disadvantaged communities is often difficult (Bonevski et al. 2014) and our user group - predominantly female and older (over 45 years) - was not representative of the population of local area. However, our aim was to capture the views of local residents who used the urban natural space and half of our users had lived in the area for their entire lives and the majority for more than five years; only two participants had been resident for less than five years. To reverse declining nature experience in urban areas will require further research on user views and the management of urban spaces to facilitate everyday nature encounters (Cox et al. 2017). In particular, studies should include people who do not use these areas in order to design spaces and interventions to encourage them to visit (Coldwell and Evans 2017).

Conclusions

In this study, views on the management of urban natural spaces were sought from local users of a case study area, whilst researchers and providers gave a national perspective. Similarities were seen between groups: local users, providers, and researchers considered that managed natural spaces were important places for interaction with nature and emphasised the need for access to these spaces. However, there were key differences regarding their management. Whilst local users preferred a wide range of spaces, both natural and formal, providers held the view that local users preferred formal spaces. This mismatch may lead to providers designing spaces which negatively affect the experiences of local users.

All groups agreed that built features played an important role in allowing a wide range of user groups to visit natural spaces and facilitating interaction with nature, pointing to an appreciation among providers and researchers of the needs of local users for accessible spaces. Our study pointed to the potential for conflict around built heritage in natural environments, with local users considering these features more important than providers and researchers.

It is important that urban natural spaces are designed to meet the needs of local users if they are to access the wide range of benefits that people can obtain from visiting nature. Providers responsible for these areas often manage multiple sites with which they may have little direct engagement. Whilst our findings indicate that generally providers are aware of user needs, the differences found highlight the importance of local knowledge regarding sites. The preferences we found among local users for both formal and more natural spaces in urban areas offer the opportunity for policies which provide co-benefits for nature and health.

Compliance with ethical standards

Approval for this study was given by the Environment Department Ethics Committee, University of York, and informed consent was given by all participants.

References

Bertram C, Rehdanz K (2015) Preferences for cultural urban ecosystem services: Comparing attitudes, perception, and use. Ecosystem Services 12:187–199. https://doi.org/10.1016/j.ecoser.2014.12.011

Bonevski B, Randell M, Paul C, Chapman K, Twyman L, Bryant J, Brozek I, Hughes C (2014) Reaching the hard-to-reach: a systematic review of strategies for improving health and medical research with socially disadvantaged groups. BMC Med Res Methodol 14:42. https://doi.org/10.1186/1471-2288-14-42

Botzat A, Fischer LK, Kowarik I (2016) Unexploited opportunities in understanding liveable and biodiverse cities. A review on urban biodiversity perception and valuation. Global Environmental Change 39:220–233. https://doi.org/10.1016/j.gloenvcha.2016.04.008

Braun V, Clarke V (2006) Using thematic analysis in psychology. Qualitative Research in Psychology 3:77–101. https://doi.org/10.1191/1478088706qp063oa

Bristol City Council (2008) Bristol's parks and green space strategy. https://www.bristol.gov.uk/documents/20182/34780/Parks%20and%20Green%20Space%20Strategy%20-%20adopted%20Feb%202008_0_0_0_0_0.pdf/6bb2635a-ac11-4f22-b6fd-5b708b329940. Accessed 23 Apr 2018

Chan KMA, Balvanera P, Benessaiah K, Chapman M, Díaz S, Gómez-Baggethun E, Gould R, Hannahs N, Jax K, Klain S, Luck GW, Martín-López B, Muraca B, Norton B, Ott K, Pascual U, Satterfield T, Tadaki M, Taggart J, Turner N (2016) Why protect nature? Rethinking values and the environment. Proceedings of the National Academy of Sciences 113:1462–1465. https://doi.org/10.1073/pnas.1525002113

Coldwell DF, Evans KL (2017) Contrasting effects of visiting urban green-space and the countryside on biodiversity knowledge and conservation support. PLoS One 12:e0174376. https://doi.org/10.1371/journal.pone.0174376

Colleony A, Prevot AC, Saint Jalme M, Clayton S (2017) What kind of landscape management can counteract the extinction of experience? Landscape and Urban Planning 159:23–31. https://doi.org/10.1016/j.landurbplan.2016.11.010

Cooper B, Crase L, Maybery D (2017) Incorporating amenity and ecological values of urban water into planning frameworks: evidence from Melbourne, Australia. Australasian Journal of Environmental Management 24:64–80. https://doi.org/10.1080/14486563.2016.1277559

Cox DTC, Hudson HL, Shanahan DF, Fuller RA, Gaston KJ (2017) The rarity of direct experiences of nature in an urban population. Landscape and Urban Planning 160:79–84. https://doi.org/10.1016/j.landurbplan.2016.12.006

Davenport MA, Anderson DH (2005) Getting from sense of place to place-based management: an interpretive investigation of place meanings and perceptions of landscape change. Soc Nat Resour 18:625–641. https://doi.org/10.1080/08941920590959613

Department for Communities and Local Government (2011) National Planning Policy Framework

Dunn RR, Gavin MC, Sanchez MC, Solomon JN (2006) The pigeon paradox: Dependence of global conservation on urban nature. Conservation Biology 20:1814–1816. https://doi.org/10.1111/j.1523-1739.2006.00533.x

Dunstan F, Weaver N, Araya R, Bell T, Lannon S, Lewis G, Patterson J, Thomas H, Jones P, Palmer S (2005) An observation tool to assist with the assessment of urban residential environments. Journal of Environmental Psychology 25:293–305. https://doi.org/10.1016/j.jenvp.2005.07.004

Dupont L, Antrop M, Van Eetvelde V (2015) Does landscape related expertise influence the visual perception of landscape photographs? Implications for participatory landscape planning and management. Landsc Urban Plan 141:68–77. https://doi.org/10.1016/j.landurbplan.2015.05.003

Natural England (2015) Monitor of Engagement with the Natural Environment headline report from the 2014–15 survey. https://www.gov.uk/government/statistics/monitor-of-engagement-with-the-natural-environment-2014-to-2015. Accessed April 2017

Finlay J, Franke T, McKay H, Sims-Gould J (2015) Therapeutic landscapes and wellbeing in later life: Impacts of blue and green spaces for older adults. Health and Place 34:97–106. https://doi.org/10.1016/j.healthplace.2015.05.001

Fish R, Church A, Winter M (2016) Conceptualising cultural ecosystem services: a novel framework for research and critical engagement. Ecosystem Services 21:1–10. https://doi.org/10.1016/j.ecoser.2016.09.002

Fuller RA, Irvine KN, Devine-Wright P, Warren PW, Gaston KJ (2007) Psychological benefits of greenspace increase with biodiversity. Biol Lett 3:390–394

Furber C (2010) Framework analysis: a method for analysing qualitative data. Afr J Midwifery Womens Health 4:97–100. https://doi.org/10.12968/ajmw.2010.4.2.47612

Furber CM, McGowan L (2011) A qualitative study of the experiences of women who are obese and pregnant in the UK. Midwifery 27:437–444. https://doi.org/10.1016/j.midw.2010.04.001

Gale NK, Heath G, Cameron E, Rashid S, Redwood S (2013) Using the framework method for the analysis of qualitative data in multidisciplinary health research. BMC Med Res Methodol 13:117. https://doi.org/10.1186/1471-2288-13-117

Gill P, Stewart K, Treasure E, Chadwick B (2008) Methods of data collection in qualitative research: Interviews and focus groups. British Dental Journal 204:291–295. https://doi.org/10.1038/bdj.2008.192

Guest G, Bunce A, Johnson L (2006) How many interviews are enough? An experiment with data saturation and variability. Field Methods 18:59–82

Harper D (2002) Talking about pictures: A case for photo elicitation. Visual Studies 17:13–26. https://doi.org/10.1080/14725860220137345

Hofmann M, Westermann JR, Kowarik I, van der Meer E (2012) Perceptions of parks and urban derelict land by landscape planners and residents. Urban Forestry and Urban Greening 11:303–312. https://doi.org/10.1016/j.ufug.2012.04.001

Husk K, Lovell R, Cooper C, Garside R (2013) Participation in environmental enhancement and conservation activities for health and well-

being in adults. Cochrane Database Syst Rev 5:1–253. https://doi.org/10.1002/14651858.CD010351

Kitzinger J (1995) Qualitative research: Introducing focus groups. BMJ: 311–299, 302. https://doi.org/10.1136/bmj.311.7000.299

Lovell R, Wheeler BW, Higgins SL, Irvine KN, Depledge MH (2014) A systematic review of the health and well-being benefits of biodiverse environments. J Toxicol Environm Health Part B: Crit Rev 17:1–20. https://doi.org/10.1080/10937404.2013.856361

Luck GW, Davidson P, Boxall D, Smallbone L (2011) Relations between urban bird and plant communities and human well-being and connection to nature. Conserv Biol 25:816–26. https://doi.org/10.1111/j.1523-1739.2011.01685.x

McCormack GR, Rock M, Toohey AM, Hignell D (2010) Characteristics of urban parks associated with park use and physical activity: A review of qualitative research. Health and Place 16:712–726. https://doi.org/10.1016/j.healthplace.2010.03.003

Mell IC (2017) Green infrastructure: reflections on past, present and future praxis. Landsc Res 42:135–145

Ministry of Housing, Communities & Local Government (2016) Local government structure and elections. https://www.gov.uk/guidance/local-government-structure-and-elections#metropolitan-districts Accessed 26 March 2018

Özgüner H, Kendle AD, Bisgrove RJ (2007) Attitudes of landscape professionals towards naturalistic versus formal urban landscapes in the UK. Landscape and Urban Planning 81:34–45. https://doi.org/10.1016/j.landurbplan.2006.10.002

Palliwoda J, Kowarik I, von der Lippe M (2017) Human-biodiversity interactions in urban parks: The species level matters. Landscape and Urban Planning 157:394–406. https://doi.org/10.1016/j.landurbplan.2016.09.003

Petrova S, Čihař M, Bouzarovski S (2011) Local nuances in the perception of nature protection and place attachment: a tale of two parks. Area 43:327–335. https://doi.org/10.1111/j.1475-4762.2011.00995.x

Pietrzyk-Kaszyńska A, Czepkiewicz M, Kronenberg J (2017) Eliciting non-monetary values of formal and informal urban green spaces using public participation GIS. Landscape and Urban Planning 160:85–95. https://doi.org/10.1016/j.landurbplan.2016.12.012

Pope C, Ziebland S, Mays N (2007) Analysing qualitative data. Qualitative Research in Health Care: Third Edition 320:63–81. https://doi.org/10.1002/9780470750841.ch7

Prévot AC, Servais V, Piron A (2016) Scientist and non-scientists share a diversity of dimensions in their relations to urban nature. Urban Ecosystems 19:1787–1799. https://doi.org/10.1007/s11252-016-0565-x

Qiu L, Lindberg S, Nielsen AB (2013) Is biodiversity attractive?-On-site perception of recreational and biodiversity values in urban green space. Landscape and Urban Planning 119:136–146. https://doi.org/10.1016/j.landurbplan.2013.07.007

Riechers M, Noack EM, Tschartntke T (2016) Experts ' versus laypersons ' perception of urban cultural ecosystem services. Urban Ecosystems 20:715–727. https://doi.org/10.1007/s11252-016-0616-3

Ritchie J, Spencer L (2002) Qualitative data analysis for applied policy research. In: Huberman M, Miles M (eds) The Qualitative Researcher's Companion. Sage Publications, Thousand Oaks, CA, pp 305–329

Ruskule A, Nikodemus O, Kasparinskis R, Bell S, Urtane I (2013) The perception of abandoned farmland by local people and experts: landscape value and perspectives on future land use. Landsc Urban Plan 115:49–61

Schipperijn J, Stigsdotter UK, Randrup TB, Troelsen J (2010) Influences on the use of urban green space - A case study in Odense, Denmark. Urban Forestry and Urban Greening 9:25–32. https://doi.org/10.1016/j.ufug.2009.09.002

Shanahan DF, Lin BB, Gaston KJ, Bush R, Fuller RA (2015) What is the role of trees and remnant vegetation in attracting people to urban parks? Landscape Ecology 30:153–165. https://doi.org/10.1007/s10980-014-0113-0

Soga M, Gaston KJ (2016) Extinction of experience: The loss of human-nature interactions. Frontiers in Ecology and the Environment 14: 94–101. https://doi.org/10.1002/fee.1225

Srivastava A, Thomson SB (2009) Framework analysis: a qualitative methodology for applied policy research. Journal of Administration and Governance 4:72–79

Tempesta T, Vecchiato D (2015) Testing the difference between experts' and lay people's landscape preferences. Aestimum 66:1–41. https://doi.org/10.13128/Aestimum-16481

Ten Brink P, Mutafoglu K, Schweitzer J, Kettunen M, Twigger-Ross C, Baker J et al (2016) The health and social benefits of nature and biodiversity protection- Executive summary. A report for the European Commission (ENV.B.3/ETU/2014/0039), Institute for European Environmental Policy, London/Brussels

The Wildlife Trusts (2017) Bringing back the wild impact report 2016/17. http://www.wildlifetrusts.org/sites/default/files/twt_annual_review_1617.pdf Accessed 26 March 2018

Wolf KL, Krueger S & Flora K (2014) Place attachment and meaning - A literature review. In: Green Cities: Good Health (www.greenhealth.washington.edu). College of the Environment, University of Washington

World Bank (2016) Urban Population 2016. https://data.worldbank.org/indicator/sp.urb.totl.in.zs Accessed 29 March 2018

Zhang Y, van Dijk T, Tan J, van den Berg AE (2015) Green space attachment and health: a comparative study in two urban neighborhoods. Int J Environ Res Public Health 12:14342–14363. https://doi.org/10.3390/ijerph121114342