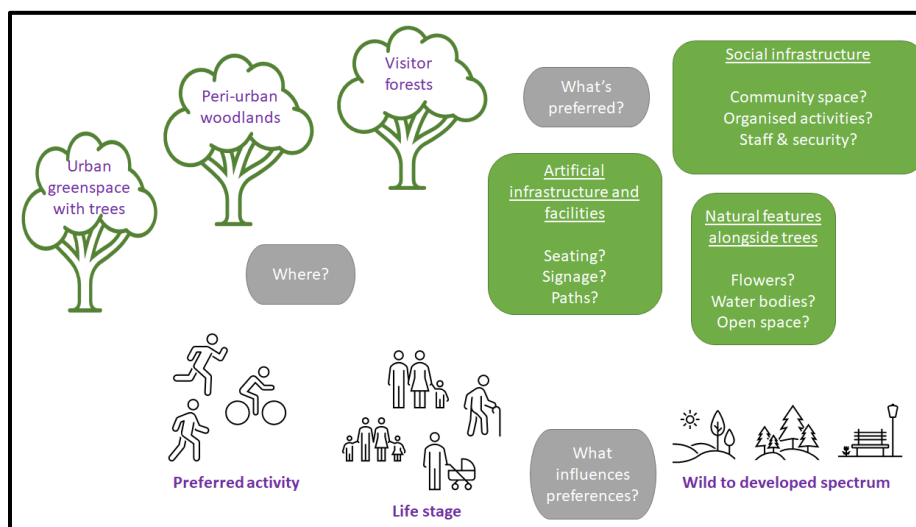# Preferences for natural features and artificial infrastructure in forests

A review of international and UK evidence

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Forest Research is the Research Agency of the Forestry Commission and is the leading UK organisation engaged in forestry and tree related research.

The Agency aims to support and enhance forestry and its role in sustainable development by providing innovative, high quality scientific research, technical support and consultancy services.

Please cite this report as: Hall, C. & Spencer, K., 2023. Preferences for natural features and artificial infrastructure in woodlands and forests. A review of international and UK evidence. Forest Research, Alice Holt, Farnham.

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1 Executive summary

Introduction

This review aims to answer the question "*What natural features and artificial infrastructure do different publics want in woods, forests and urban greenspaces with trees*?".

Using a combination of structured search strings and key word searches, the search process uncovered 41 relevant publications from 17 individual countries, published between 2002 and 2022 (inclusive).

Given the policy ambitions for tree planting and woodland expansion across Great Britain, from the United Kingdom (UK), Welsh and Scottish Governments, the findings from this review are timely. The findings provide valuable evidence of public preferences for artificial facilities and natural features in woods, forests and urban greenspaces with trees, and reveal gaps in the evidence where further work is required.

Key findings

The key findings from the review are summarised in the three matrices below (Tables 1, 2, 3), to show where there is evidence that people like to see particular facilities and natural features in different treescapes. An "x" indicates that there is evidence from a specific study. Where text is added in brackets after an "x" there is more information provided by that study about 'whose' preference was reported or 'what' specifically was preferred.

Across the three types of location included in this review (urban greenspace with trees; peri-urban woodlands; large visitor forests) there is ample evidence about preferences for seating and paths/trails. However, the range of facilities and infrastructure captured is very broad, and includes: paths, seating, tables, catering outlets, car parking, signage, litter bins, toilets, information, play areas and

equipment, sporting equipment and spaces, and more. For example, there is considerable evidence that people like spaces to be clean and tidy, and hence wish to have litter bins provided.

With regard to differences between people and between location types there are numerous important findings. Facilities such as benches and seats were generally shown to be favoured more strongly by older people. Preferences for paths and trails tended to be related to the favoured activity type of individuals. Generally speaking there appears to be greater concern from women for places that feel safe and secure, hence lighting and other security related infrastructure was often higher on their list of preferences. Related to this, women often appear to favour any infrastructure, the implication being that more facilities will mean there are likely to be more people and hence, again, there is a perception that this increases feelings of safety. Parents with small children had mixed preferences with regard to play facilities within woods and forests. While this was often important there was also a recognition that trees, woods and forests themselves provide opportunities for exploration and adventure without the need for artificial play equipment. Signage and information was, unsurprisingly, more important for visitors and tourists to woods and forests than local residents. The evidence around the desire for car parking appears to show that preferences increase based on location; that is, in urban greenspace with trees there is only some small amount of evidence that this is important to people, but at larger, more distant destination forests there is much greater evidence that the presence of car parking is important to most people.

With regard to other natural features alongside trees, there is much less evidence than that relating to artificial infrastructure. However, there is evidence that in urban parks the preference is often for open spaces with trees around the edges, allowing for social gatherings and other recreational activities. This also helps to generate feelings of greater safety, or minimise concerns about potential hiding places for people perceived to pose a threat. Some people also expressed a wish to

see some colourful flowers in their local park, alongside trees and also shrubs and ornamental grasses. Hence, diversity and well kept spaces are important in urban greenspace. Within large visitor forests some people like to see water bodies, and in some cases (particularly women), also favoured some open glades and meadows. Viewpoints are also desired.

Alongside preferences for artificial infrastructure and natural features a third category was evident from the literature, that of social infrastructure. This incorporates organised events and activities, spaces for social gatherings, places for communities to come together, and the presence of other people including staff and security.

Table 1 Matrix of preferences in urban greenspaces with trees

Location type >	Urban greenspaces with trees	
Facility / artificial infrastructure		
Bench / chair / seating	x x x x x x (older people) x (dispersed seating)	7
Drinking fountain / water source	x	1
Path / pavement	x x x x x (level footpaths and smooth surfaces – for older people) x (accessible walkway) x (natural path) x (natural path)	8
Tables / picnic tables	x	1
Playground / play equipment / play areas /	x x x (parents) (women)	3
Sports facilities / areas for sports activities	x x (middle aged; families with children) x (volley ball court) x (space for yoga)	4
Monitoring facilities	x	1
Protective fences	x	1
Fitness trails	x	1

Café / catering / restaurant	x x (older people)	2
Toilets	x (older people)	1
Car-park / parking areas	x	1
Maps & information; signage / inc educational trails	x (elderly women)	1
Greenhouse	x	1
Monuments/ memorials / sculptures	x	1
Natural features		
Colourful flowers	x x x	3
Greenspace – not wild	x	1
Open areas of grassland / large flat open spaces for group activities	x x	2
Open space edged with trees	x (active users)	1
Grassy areas interspersed with trees	x (passive users)	1
Multi-species flowerbeds	x x (older people)	2
Open view	x	1
Shade	x	1
Colours	x	1
Fragrance	x	1
Beauty	x	1
Grass	x	1
Food bearing plants	x	1
Ornamental grasses	x	1
Water features (fountains)	x	1
Greenspace patches with trees for passive use	x	1
Rose garden	x	1
Tree trail	x (young adults and families)	1
Animals & birds	x x	2
Shrubs and bushes	x x	2
Neat lawns	x	1
Wild flowers	x	1

Water /stream/ pond	x	1
Social infrastructure		
Social infrastructure / social space / social connections / activities	x (culturally diverse user groups) x (groups with special needs – cycling club)	2
Presence of other people	x (older people) x (important for feelings of security – elder people especially)	2

Table 2 Matrix of preferences in peri-urban woodlands

Location type >	Peri-urban & urban fringe woodlands	
Facility / artificial infrastructure		
Bench / chair / seating	x x (older people) x (older people preferred least naturalistic design but most comfortable looking)	3
Path / pavement	x x (more women than men) (less important for more educated) x (deprived communities) x (tarmac path preferred by walkers cutting through en route to somewhere else) x (rougher tracks preferred by dog walkers) x (older people)	6
Playground / play equipment / play areas	x (parents) x (teenagers)	2
Waste bins / litter bins	x x	2
Sports facilities / areas for sports activities	x	1
Café / catering	x	1
Toilets	x (older people)	1
Car-park / parking areas	x (more men than women) (less important for more educated) x (older people)	2
Maps & information; Signage / information; inc educational trails	x x x (visitors) x (those concerned about safety)	6

	x (older people) x (older people)	
Education facilities	x (mothers)	1
Trails	x (differs between user/ activity groups) x (need for accessible trails for wheelchair users)	2
Refreshment areas	x (less important for more educated)	1
Picnic area	x	1
Wilder play areas	x (parents)	1
Natural features		
Open areas of grassland / open meadows	x (more women than men) (more popular with younger age group)	1
Social infrastructure		
Social space	x (teenagers)	1
Staff	x (those concerned about safety)	1

Table 3 Matrix of preferences in large forests

Location type >	Visitor destination forests	
Facility / artificial infrastructure		
Bench / chair / seating	x x x x x (rustic style bench preferred) x (older people)	6
Drinking fountain / water source	x x	2
Path / pavement / tracks / trails	x x x x x (wide forest paths) x (wide trail) x (formal, hardened paths – walkers, joggers, bikers) x (non-hardened paths – horse riders) x (forest route most preferred) x (women more than men) x (condition important to elderly and female visitors) x (mixed type of route preferred by women and those under 20 or over 40)	16

	x (some family groups prefer water front forest route) x (downhill cyclists prefer dedicated downhill trails) x (nature watchers prefer nature trails, off the beaten track) x (older people)	
Tables / picnic tables	x x	2
Playground / adventure playground / play equipment / play areas / go ape	x x x (younger visitors) x (female visitors)	4
Waste bins / litter bins	x x x x x	5
Café / catering / restaurant	x x	2
Toilets	x x (older people)	2
Car-park / parking areas	x x x (women more than men) x (older people moreso) x (older people)	5
Maps & information; Signage / information; inc educational trails	x x x x (older people moreso) x (finger post with icons preferred) x (older people) x (especially parents with younger children)	7
Refreshment areas	x x (men more than women)	2
Photographic / scenic opportunities	x (younger visitors)	1
Shelters	x	1
Barbecue area / cooking grills / fire sites	x x x (older people moreso) x (fire sites away from forest roads) x (covered BBQ area most preferred)	5
Telephones	x	1
Accommodation	x	1
Wildlife hides	x (nature watchers)	1
Visitor centre	x	1
Natural features		

Open areas of grassland / open meadows / forest clearings	x x (women more than men)	2
Open view / panoramic view	x (men more than women)	1
Water /stream/ pond	x	1
Social infrastructure		
Social infrastructure / social space / social connections / activities	x (female visitors) x (ethnic minority groups) x (those with disabilities)	3
Law enforcement	x	1

Challenges

One aim of this review was to identify different preferences across different location types, namely, large visitor destination forests, away from urban centres; smaller, more local, peri-urban and urban fringe woodlands; and urban greenspaces with trees, including urban parks. However, the challenge of identifying preferences in the different location types arose because the UK context is in many cases somewhat different to other countries. The term 'urban forest', for example, does not particularly apply in the UK context but is often found in literature from other countries. The reverse is true of urban fringe and peri-urban woodlands, as these are particularly referred to in the UK context. The authors of this review have therefore taken care to understand the context being described in international publications, and at times this differs from the term used in the publication.

Gaps

Overall, there is much more literature on artificial facilities and infrastructure, than in relation to other natural features that people like to see alongside trees in any setting. There is more evidence from urban greenspaces with trees and large visitor forests, than peri-urban woodlands. The UK evidence is very much focused on studies in England. While there is a considerable amount of literature discussing

preferences for play areas and facilities in parks, woods and forests this is from parents and not the children themselves. The literature from urban greenspaces with trees is almost entirely based on urban parks, and yet there are many other types of urban greenspaces with trees. This review includes a few studies (hospital grounds for example) but very little was found.

2 Introduction

2.1 Policy context

Concerns over climate change and habitat loss, and the growing recognition of the importance of trees and greenspace for peoples' health and well-being have resulted in strong policy interest in tree planting and woodland expansion. The United Kingdom (UK) Government's '25 year Environment Plan' includes a focus on woodland to maximise its many benefits through supporting the development of a new Northern Forest and larger scale woodland creation (Defra, 2018). To address this, the UK government has set a target for tree planting rates in England to be 7,000 hectares each year by May 2024 as part of its England Trees Action Plan (Defra, 2021). The Welsh Government has an aspiration to plant 100,000 hectares of new woodland by 2030 to help Wales meet its carbon emission reduction targets (Welsh Government, 2018). In the spring of 2020, the Welsh Government announced a commitment to a 'National Forest for Wales' with the aims to create areas of new woodland and help to restore ancient woodlands[1]. The Scottish Government target is to increase tree cover from 18.8% in 2019 to 21% in 2032 (Scottish Government, 2019).

Given the tree planting and woodland expansion targets of the UK, Scottish and Welsh governments it is important to understand what 'types' of future woods and forests people want in terms of infrastructure and facilities and also treescape design alongside and amongst other natural features and types of greenspace. This review aims to address this by providing evidence relevant to this topic.

2.2 Programme 3: Introduction

Programme 3, one of seven Forest Research Core Funded Programmes, is called 'Societal Benefits' and focuses on the wider societal wellbeing benefits of, and

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[1] [National Forest for Wales | GOV.WALES](https://gov.wales)

relationships with, trees and woodlands to explore how these change across the urban-rural continuum and over time. Crucially, the programme will aim to investigate how best to maintain and improve the delivery of these benefits as new treescapes are being created, and existing ones expanded.

Programme 3 has two work areas (WA). This review report is an output for WA1: "Societal perspectives on and engagement with urban, peri-urban and rural treescapes". The review considers evidence that has investigated public preferences for facilities, infrastructure and natural features in woodlands, forests and urban greenspaces with trees.

2.3 The search topic

The full review question is as follows:

"*What natural features and artificial infrastructure do different publics want in woods, forests and urban greenspaces with trees*?"

in this review 'feature' is defined as any 'natural' feature in the landscape or component of the landscape that is not trees, but which is in place alongside trees (for example, a water body, a meadow area, a flower bed, farmland and so on).

Facilities and infrastructure refer to artificial items constructed and provided by people and site managers, including paths, benches, sports equipment, play areas, litter bins, signage and so on. For a more complete list of relevant examples of features, facilities and infrastructure of interest, see the next section. Paletto et al (2017) refer to two categories of attributes, namely 'innate' characteristics (e.g. natural resources) and artificial characteristics (e.g. network of trails, facilities for sport and recreation). This is somewhat similar to the definitions used in this report, although the term 'artificial' may not be wholly useful as the other 'natural' features alongside trees are often also artificial – eg flower beds, water bodies, hedgerows (which are trees).

There is particular interest in understanding what natural features, facilities and infrastructure are preferred by the public in different locations, at different distances from their homes and population centres. Hence, this review considers facilities, infrastructure and features in urban greenspaces with trees (including urban parks), peri-urban woodlands and large visitor destination forests, the latter generally being further from large population centres in Britain.

2.4 Key search terms

To help structure the search strings for this evidence review the following search terms were compiled and discussed (Table 4). These terms were broken down into population; interest; place; (natural) feature and infrastructure. Note that not all terms were included in the search strings but rather were used to assist the authors when sifting publications by providing guidance for inclusion / exclusion.

Table 4: Search terms and topics of interest

Population	Interest	Place	Feature	Infrastructure
Community Public Resident Household Visitor Tourist Citizen Volunteer People Children	Perspective Attitude Opinion Perception Perceive View* Preference	Tree* Woods Woodlands Forests Street trees Hedgerows	Lake Pond River Stream Meadow Parkland Flowers Wetland Hill Grassland Farmland Reservoir Fields Wildlife Garden Flowerbed Blossom	Path Track Trail Guide Sign Bench Seat Toilet Café Facilities Carpark Accessibility Activities Map Playpark Adventure playground Shop Catering Refreshments

				Education Learning Statue Art Sculpture Display Heritage Visitor centre Restaurant Cycle path Litter bins

2.5 Search strategy

The items and terms in Table 4 were used to construct search strings.

The approach was threefold: the use of Scopus for structured searches; expert consultation for other references, including grey and unpublished literature; and additional targeted searching in Google Scholar.

'Scopus', the largest abstract and citation database of peer reviewed literature, was used (see the search strings in Table 5). Searches were limited to 'Title, abstract, key words'. Additional restrictions were applied: Publication year 2000 onwards; a filter by subject area - limited to: Social sciences, environmental science, agricultural and biological sciences, earth and planetary sciences, arts and humanities; and language - limited to English.

Having run the search using the search string, hits were sorted by relevance and the first 100 titles and abstracts were exported to Excel. Titles, abstracts and full texts were read in stages with publications being excluded at each stage if they were not considered relevant. Table 5 shows how many studies remained after each filtering stage. Two search strings were used, with the second adding the terms (UK OR united AND kingdom OR Britain OR England OR Wales OR Scotland OR Ireland) to check for additional UK and Ireland specific studies.

Google Scholar was used for more targeted searches using combinations of key words (for example, *urban greenspaces trees facilities infrastructure uk; attitudes facilities urban parks UK trees*).

2.6 Number of publications

The number of relevant publications at each stage of the reading process is shown in Table 5.

Table 5: Searches and number of publications

	After reading titles (no of relevant studies)	After reading abstracts (no of relevant studies)	After reading full papers (no of relevant studies)
Scopus search			
(Tree* Or Wood* OR Forest* or Hedge*) AND (Community OR Public OR Resident OR Household OR Visitor OR Tourist OR Citizen OR Volunteer OR People OR Children) AND (Perspective OR Attitude OR Opinion OR Perception OR Viewpoint OR Perceive OR Preference) AND (facilities OR infrastructure)	68	39	26
(tree* OR wood* OR forest* OR hedge*) AND (community OR public OR resident OR household OR visitor OR tourist OR citizen OR volunteer OR people OR children) AND (perspective OR attitude OR opinion OR perception OR viewpoint OR perceive OR preference) AND (facilities OR infrastructure) AND (uk OR united AND kingdom OR britain OR england OR wales OR scotland OR ireland)	13	12	9
Additional publications from Google Scholar searches & expert consultation	-	-	6

Total number of studies			41

The figures below show the countries where studies were carried out (Figure 1) and the dates the studies were published (Figure 2). As can be seen, the majority of the studies are from the UK but overall cover 17 individual countries (with a couple of studies providing evidence from multiple countries). Although the search parameters in Scopus were set from 2000 to present day (2022), the evidence in this review is from 2002 onwards as no relevant publications were found that were dated prior to then.
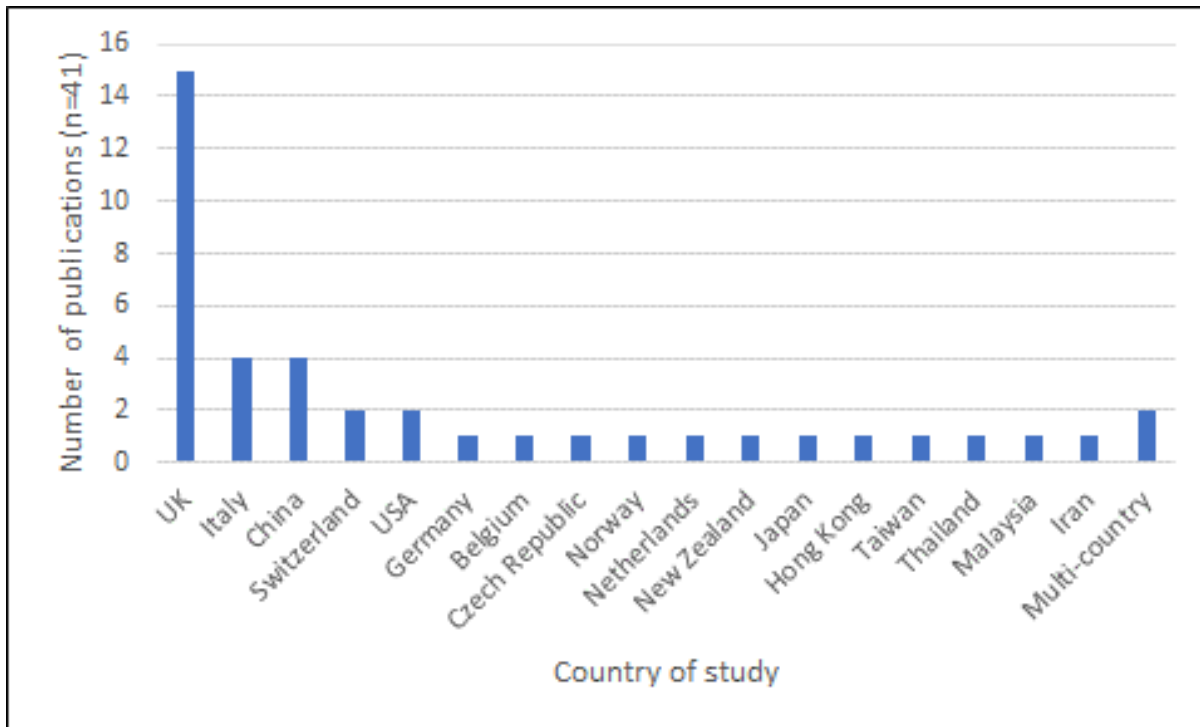
Figure 1 Country of study
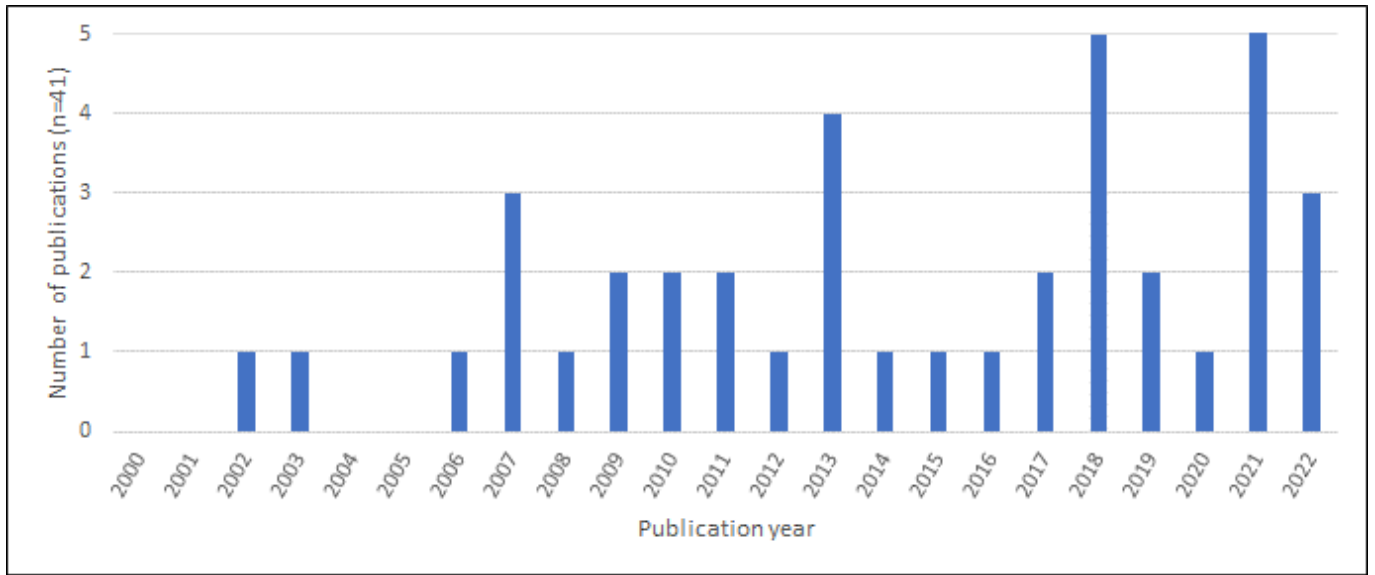
Figure 2 Year of publication

The structure of the report is as follows. There are three main sections, each focused on a type of location; urban spaces with trees; small, peri-urban woodlands; large visitor forests. Within each of these three main sections the evidence is split between international evidence and evidence from the UK and Ireland. Further, within each of those sub-sections are sections split between preferences for facilities and artificial infrastructure, and preferences for natural features.

3 Urban spaces with trees, including urban parks

3.1 International evidence

Several studies have looked at public preferences for facilities and features in urban parks and other public urban greenspaces with trees in continental Europe and elsewhere.

3.1.1 Preferences for facilities and infrastructure

Artificial facilities and infrastructure can be important elements in urban greenspace design, and studies around the world have examined preferences for these. Some studies have also explored differences in preferences for facilities in urban spaces with trees between socio-demographic groups, or explored the preferences of specific sub-groups in depth. Examples from this literature are reviewed below.

Benches, drinking fountains and paths were important factors influencing survey respondents' preferences for different urban greenspaces in Italy (Campagnaro et al, 2020). In terms of layout of these features, residents surveyed in Hong Kong preferred seating within large parks to be dispersed (Lo & Jim 2012). In Taiwan Liu and Chuang (2018) investigated visitor preferences for urban greenspace facilities. Facilities such as paths, tables and chairs, lighting, bike racks and bins were found to be the most important attributes, while features including public art and information signs were the least important.

In an online survey van Vliet et al (2021) presented Dutch respondents with 16 theoretical park designs with few trees, some trees or many trees, combined with different facilities, including benches, paths and playgrounds, and natural features such as flowerbeds. They found that people valued many benches and a playground. Older people in particular valued benches, while women and people with children (unsurprisingly) valued the presence of a playground with a climbing frame, slide, swing, and seesaw.

In a study by Krajter Ostoic et al (2017) looked at preferences for urban forest and greenspace facilities across seven Balkan cities and between socio-demographic groups. In some locations, age was a statistically significant factor in perceptions around the need for more bike paths in urban forests and greenspaces (for example) but not in other locations. Education level had some influence on concerns around lack of benches, and provision of waste bins and cycle paths in urban forests and greenspaces, but was not important for perceptions around lack of lighting or the need for more community wardens. Household income was the least important characteristic for determining preferences for urban forest greenspace facilities; the only statistically significant relationship was between income level and concerns around waste bin provision and lack of benches in one location (Zagreb) (Krajter Ostoic et al 2017). Overall, the authors concluded that levels of concern around the presence and quality of facilities such as waste bins, benches and lack of bicycle paths varied between cities. Hence, from their detailed study, looking at seven different locations and examining a wide range of socio-demographic characteristics, it is difficult to draw any firm conclusions about preferences for facilities in urban greenspaces with trees and how they differ between different socio-demographic groups.

Other studies appear to show more clear-cut results. For example, Lo and Jim's (2012) study found that Hong Kong residents aged over 50 or retired desired more seating in urban greenspaces, whereas those aged 31–49 and families with children prioritised increasing provision of sports facilities. The authors attribute the desire for seats among older residents as reflecting greater participation in passive activities and social interactions. In contrast, middle-aged people are more likely to have children and therefore require active leisure facilities. This echoes findings from the Dutch study (van Vliet et al, 2021) referenced above. Based on their survey with Shanghai residents, Li et al (2019) emphasise the importance of considering the needs of elderly people when designing urban parks and greenspaces with trees, for example creating accessible walkways.

Education level was found to be important for perceptions around features of urban parks in Hong Kong. More highly educated residents had less strong preferences for more seating in parks (Lo & Jim, 2012). The authors suggested that more highly educated individuals have greater recognition of the importance of nature, and thus are not so concerned with artificial facilities such as seating.

Some artificial facilities have been found to be linked to feelings of safety (Campagnaro et al 2020, Wang et al 2022). Wang et al (2022) found that in China, visitors' preferences for 'monitoring facilities', protective fences, sanitation facilities and rest facilities helped to increase their feelings of safety, through a reduction in anxiety, fear and a sense of solitariness. Campagnaro et al (2020) found that perceptions of safety in an Italian urban greenspace could be increased by adding fitness trails and benches, as this implied increased 'informal surveillance' through a greater presence of other people.

3.1.2　Preferences for natural features

Several studies have sought to identify the urban greenspace features that people like (or would like) alongside trees in urban spaces. Shanghai residents appreciated greenspaces featuring large open areas of grassland with patches of trees along the edges as this design allows people to be close to nature while also enjoying other recreational activities (Li et al 2019). Campagnaro et al (2020) analysed preferences for three different types of vegetation structure in urban greenspaces in Padua, Italy, finding that survey respondents wanted to have sparsely growing trees, in a greenspace setting that did not feel particularly 'wild', with the trees interspersed with colourful flowers. They found that a vegetation structure that does not block the view improved feelings of safety. Talal et al (2021) conducted qualitative interviews with visitors to 15 urban parks with trees in Portland, Oregan (USA), and found that alongside the trees participants valued shade, colours, fragrance, beauty, and grass. Some participants also wanted there to be food-bearing plants, although this is not elaborated on. In another study, people

preferred a park design with many trees but semi-open space between and with multi-species flower beds (van Vliet et al, 2021).

Again, some studies examined this topic to see if there are differences between different socio-demographic groups. For example, old people appreciated multi-species flowerbeds (van Vliet et al, 2021). Not all reviewed studies for this section had investigated preferences in urban parks with trees. Recognising the importance of green spaces and trees for patient recovery and restoration, Allahyar and Kazemi (2021) explored preferences for natural features alongside trees in the grounds of a children's hospital in Iran. They found that, alongside weeping form trees, the children (patients) expressed preferences for flowers and ornamental grasses in planted flowerbeds, as well as water features (fountains) contained within the flowerbeds.

3.2 Evidence from the UK and Ireland

3.2.1 Preferences for facilities and infrastructure

Highly relevant to the current review, Ozguner and Kendle (2006) presented visitors to two green sites with trees in Sheffield with a long list of formal and naturalistic attributes. Respondents chose their most liked features for a park and botanical garden (Tables 6 and 7 (in the next section)). Not all formal attributes were relevant to both sites but of those that were, natural paths and benches and seats were strongly 'liked' at both locations. Within the park play equipment and recreation facilities were strongly favoured.

Table 6 Preferences for artificial features in two urban greenspaces with trees

Infrastructure	Frequency of 'likes' for feature in botanical garden, location?	Frequency of 'likes' for feature in Endcliffe Park, Sheffield
Greenhouse	72	-

Natural paths	58	79
Benches & seats	54	31
Monuments, memorials & sculptures	53	16
Rose garden	52	-
Hard paths	18	40
Formal hedges & fences	16	7
Paved areas	13	16
Play equipment	-	66
Recreation facilities	-	59
Other features	7	4

Alves et al (2008) conducted a survey of people aged over 60 (n=237) across twenty Local Authorities in Great Britain to identify the relative importance of different features and facilities to older people's preferences for neighbourhood parks with trees. Aspinall et al (2010) reported analysis of the data from that survey to identify the most significant facilities and infrastructure influencing older people's decisions to visit. From a list of attributes that might impact a decision to visit (either positively or negatively) results showed that provision of facilities including cafes and toilets was of high importance in encouraging visits by older people (Alves et al 2008, Aspinall et al 2010). Pavements (both provision and qulaity), car parking and seats in the park were all important (Aspinall et al 2010).

Preferences were affected by two variables: whether older people live alone or have mobility issues. Provision of seating both in a park, and en route to a park had greater relative importance for those with limited mobility (Alves et al 2008,

Aspinall et al 2010). For those living with someone, provision of facilities and a car park were relatively more important than for those living alone, who placed greater relative importance on distance to the park, as they may be less likely to have access to a car (Alves et al 2008, Aspinall et al 2010).

In a study examining use of space in three different urban parks (in Edinburgh and Ljubljana) Golicnik and Ward Thompson (2010) found that spaces with trees were utilised in different ways by different groups, depending on their preferred activities. Large groups wishing to participate in group activities including sports appreciated large open spaces edged with trees and paths, while passive users were more likely to opt for areas interspersed with trees and paths. In another UK park study trees played a central role in numerous social activities (Layton & Latham, 2022). Public users of Finsbury Park valued spaces beneath, among or alongside trees where they could participate in yoga or volleyball. The presence of a tree trail was particularly valued by young adults and families. What these studies demonstrate is the importance of trees as they play a part in social space.

The importance of 'social infrastructure' is also relevant to feelings of personal safety and security. Jorgensen and Anthopoulou (2007) found that elderly people in particular value the presence of other 'friendly' people for this reason. This social infrastructure may be just as important as the presence of physical infrastructure like seating, good smooth paths, handrails on steep paths, access routes, and signs, maps and information. Combined, such social and physical infrastructure, is important in facilitating usage by elderly visitors.

3.2.2   Preferences for natural features

When it came to the naturalistic features of the two Sheffield greenspaces with trees, Ozguner and Kendle (2006) found a high preference for the trees and woodlands themselves at both sites but also a strong liking for water, flowers,

wildlife and other vegetation (shrubs and bushes) alongside trees at the locations (Table 7).

Table 7 Preferences for natural features in two urban greenspaces with trees

Landscape feature	Frequency of 'likes' for feature in botanical garden	Frequency of 'likes' for feature in Endcliffe Park
Specimen trees + groups of trees	92 + 59	117 (trees)
Woods and woodlands	45	90
Water, stream & ponds	-	140
Flowers & flower beds	115	19
Animals, birds, wildlife	111	100
Neat lawns	71	16
Shrubs & bushes	69	41
Long grass & meadows	-	34
Wild flowers	41	33

Aspinall et al (2010) (already referenced above) also surveyed older people about the natural features that might encourage (or discourage) them to visit urban parks with trees. Results showed that other plants along with trees were important; the older people surveyed liked to see trees alongside footpaths, and also liked to see a water feature alongside trees.

4 Peri-urban, urban fringe and small local woodlands

Peri-urban, urban fringe, and local woodlands in the UK context tend to be small, often unmanaged woodlands near to population centres and residential areas. They are commonly found on the edges of towns where agricultural land is located and form part of the farming landscape. This category of woodland type may also include community-managed woodlands. Paletto et al (2017, p315) quote Blazevska (2012) who states that peri-urban forests can be defined as forest stands with amenity values situated near to urban areas. Nath & Magendran (2021) refer to peri-urban forests as being forests that extend to the outer metropolitan area.

4.1 International evidence

4.1.1 Preferences for facilities and infrastructure

Several international studies have explored preferences for artificial facilities and infrastructure in peri-urban woodlands and forested areas on the urban fringes of towns and cities. Nath and Magendran (2021) asked visitors to a 300 acre community-managed peri-urban forest on the western outskirts of Kuala Lumpur (Malaysia) their opinions of its forest trails. Suggestions for improvements to the trails included installation of signage with information on the forest and trail distances or completion times. The authors suggest this would help improve visitor awareness about the trails as well as providing information about rules and sanctions to avoid negative behaviours such as littering (Nath & Magendran 2021). Visitors were also asked their opinion on the suitability of its trails for different activities. Three quarters felt the existing trails were 'sufficient' for hiking and biking. Fifteen percent felt the trails were not suitable for biking, as they were either too steep or were becoming eroded by heavy usage (Nath & Magendran 2021).

Visitors to Monte Morello Forest, an un-managed peri-urban woodland near Florence (Italy), were found to have positive perceptions of woodland facilities when asked through a survey (Paletto et al 2017). Of five artificial facilities presented to respondents, bins were most appreciated, followed by picnic areas, benches and areas for sports activities, while trail markers were least appreciated. Fourteen per cent of visitors reported that facilities such as bins, picnic areas and sports areas had a negative impact on the attractiveness of the forest, while nearly 20% said the impact was very negative (Paletto et al 2017).

Cantiani et al (2018) studied socio-demographic differences in preferences for woodland facilities of peri-urban forests around the town of Trento in Italy. The study was carried out where the urban areas are in close connection to forested areas, which are easily reached from the town centre, either by bus or on foot. They found that elderly people and those with more sedentary lifestyles were more likely to prefer artificial facilities and infrastructure to 'innate' or 'natural' woodland features (Cantiani et al, 2018). The authors found that more women than men preferred footpaths, while more men than women preferred car parks. Preferences for footpaths and benches increased with age. The perceived importance of footpaths, refreshment areas and car parks also decreased with education level (Cantiani et al 2018).

4.1.2   Preferences for natural features

The review uncovered very little evidence about other natural features desired alongside trees in peri-urban woodlands in the international literature. However, Cantiani et al (2018) found that more women than men preferred open meadows, while preferences for open areas and meadows decreased with age.

4.1.3   Preferences on a spectrum from wild to developed

It is possible to categorise woodland visitors based on their preferences for 'natural' features and artificial facilities in peri-urban woodlands and urban fringe forested areas. The Cantiani et al (2018) study already referenced above used survey results to categorise residents in Trento (Italy) based on their preferences. They identified two distinct groups who varied according to their preferences for forest features and attributes. The first group preferred 'innate' forest features such as meadows, open areas, wildlife and views, and the second group (mostly elderly people and those with sedentary lifestyles) preferred artificial facilities such as footpaths, benches, refreshment areas and car parks.

4.2 Evidence from the UK and Ireland

4.2.1   Preferences for facilities and infrastructure

Preferences for facilities in peri-urban woodlands in the UK and Ireland have been explored through questions about the effect of improvements, and the hypothetical improvements people would like to see. Ward Thompson et al's (2013) longitudinal study compared changes in perceptions of woodlands over time at two sites with high levels of socio-economic deprivation in Glasgow. Perceptions were measured before and after a programme of improvements at the 'intervention' site (Bluebell woods, in Drumchapel), which included infrastructural improvements such as the construction of footpaths and installation of signage, and compared with measurements from the 'comparison' site at Milton, which was not part of the scheme (the 'Woodlands in and around town' programme (WIAT)). Development of woodland facilities was one element of the improvement works, and both visitor numbers and stated satisfaction with the quality of the environment increased at the intervention site, compared with no change at the comparison site. Perceptions around difficulty accessing the woodlands decreased at the intervention site, suggesting that construction of footpaths had helped (Ward Thompson et al, 2013).

In another UK study, Doick et al (2013) asked visitors to Thames Chase woodlands about hypothetical improvements to woodland facilities. Respondents felt the frequency of seating was sufficient for the number of visitors. There were high levels of support for interpretation signage, with less than 2% wanting no signage; interpretation signs at car parks were appreciated as a way of identifying places to visit. Increasing facilities such as the provision of litter bins was the preferred investment option at the peri-urban woodland site (Doick et al 2013).

Doick et al (2013) also investigated preferences of participants engaging in different activities. The study found that at Mardyke Woods, a site which most visitors walked through as a shortcut, a tarmac path was most popular as it was clean and easy to walk on. At Cely Woods, a 'recreation' site where dog walking was the main activity, more naturalistic paths (i.e. wide mud tracks with patches of rough grass) were preferred (Doick et al 2013).

Lack of lighting at urban fringe locations can produce feelings of places being unsafe (Tzoulas & James 2010) and people concerned about safety tend to desire more intensive site management and more facilities, for example in the form of signage and the presence of staff (O'Brien et al, 2014).

Numerous studies have explored how preferences for facilities in peri-urban woodlands vary between different socio-demographic groups. Several studies found that age affected preferences for facilities in peri-urban woodlands. Older people visiting Bentley and Brodsworth Community woodlands valued 'managed' woodlands with facilities such as footpaths, toilets, information boards, benches and car parks as they enabled access and gave them confidence to visit the woodlands (O'Brien, et al 2014). Age was also found by Doick et al (2013) to significantly affect preferences for design and provision of facilities in Thames Chase woodlands. For most age groups a recycled plastic bench with backrest (the least natural looking of five bench options) was the least preferred option, for those aged over 65 it was the preferred option, as it appeared the most ergonomic and comfortable.

In Thames Chase preferences for interpretative signage increased with age, with participants aged over 45 citing their importance for informing young people about woodlands, despite those in the 16-25 age group stating they were satisfied without interpretation signs. The authors suggest they may prefer finding their own information or using more interactive, social media- based forms of information provision (Doick et al 2013).

Parents interviewed in O'Brien et al's 2014 study found purpose-built play areas beneficial for encouraging children to be active, but also expressed the need for some 'wilder' areas with little or no infrastructure. An evidence review by O'Brien and Morris (2013) found that parents valued educational facilities for children. Alongside this they found that teenagers expressed a preference for organised activities (e.g. paint balling and Go Ape) suggesting they desire a combination of equipment infrastructure and social infrastructure.

Accessible trails are important in enabling disabled people to use the forest (O'Brien & Morris 2013), but one wheelchair user in O'Brien et al's (2014) discussion group highlighted that not everywhere can be made accessible as it would change the very 'nature' of the woodlands; physical challenge is part of the reason people visit woodlands and other outdoor green spaces.

Several studies identify concerns around safety and vandalism relating to facilities in peri-urban woodlands (Ward Thompson et al 2013; O'Brien et al 2014; Tzoulas & James 2010; Doick et al 2013). In local documents about Birchwood Forest Park (Warrington) analysed by Tzoulas and James (2010), nearly a quarter of concerns related to the need to restore vandalised park facilities (e.g. benches or sports facilities), which were seen as 'unwelcoming'. Similarly, past issues with vandalism were cited by participants as a reason for not wanting to increase seating provision at two sites in Thames Chase woodlands, although replacing vandalised facilities was a priority (Doick et al 2013).

5 Large visitor destination forests

This section includes literature that has investigated visitor preferences for infrastructure, facilities and other natural features in large forests. In the UK these are located away from urban centres and are often part of the Public Forest Estate.

5.1 International evidence

5.1.1 Preferences for facilities and infrastructure

Several European studies have ranked preferences for different facilities in large forest parks, with varied findings. A survey of visitors to Blaník Protected Landscape Area (Czech Republic) found that nature trail panels were considered the most appropriate forest route facilities, followed by places with tables for resting or eating, a water source and benches, while a barbecue area was considered least appropriate (Drábková & Šišák 2013). In contrast, survey respondents from Trento (Italy) ranked picnic benches and tables, alongside fitness trails, amongst the least important facilities for large forests, while parking areas, paths and refreshment points were considered the most important (de Meo et al 2015). Amongst visitors (n=526) to large forests south of Leuven (Belgium), litter bins were considered the most important facility, with 88% of respondents confirming they should be present in the forest, compared with 18% for catering facilities, which were considered the least important (Roovers et al 2002). Frick et al (2018) used data from a national survey on forests to compare preferences for three categories of forest facility in Switzerland: respondents preferred social (eg. benches, shelters, playgrounds and barbecue sites) and educational (eg. nature trails) infrastructure over sports infrastructure (eg. mountain bike trails and high ropes parks).

Outside Europe, Qin and Cheng (2021) measured the importance of four types of facilities for forest tourism performance in China, by using tourist revenues and tourist numbers as an indicator of impact on tourism performance. Walkways and lodging facilities were found to exert a significantly positive impact on both tourism

revenue and number of tourists, and catering facilities had a significant positive impact on number of tourists only, although the impact varied across forest parks and regions (Qin & Cheng 2021). In the USA, Latino visitors to four National Forest sites in Southern California were asked about the importance of different visitor facilities. The amenities cited by the most respondents as important or very important varied between sites, but included rubbish bins, telephones, parking areas and cooking grills, as well as water taps, picnic tables and law enforcement (Chavez & Olson 2009).

Some studies have explored preferences for particular types of infrastructure linked to specific activities. Hegetschweiler et al (2007) interviewed groups of visitors to the Schonmatt-Plateau and Allschwil forests near Basle (Switzerland) who had made fires at official picnic sites with barbecue pits (n=113) and at fire rings outside the designated sites (n=101). Visitors to these two forests were split between preferences for well-equipped designated barbecue sites and those with more natural infrastructure (e.g. stones forming a fire ring rather than concrete rims, and logs to sit on instead of benches) (Hegetschweiler et al 2007). Across both forests seating and rubbish bins were considered the most important facility at a picnic site (Hegetschweiler et al 2007). Other studies have explored preferences for forest trails, with evidence suggesting that visitors prefer wide forest paths (Arnberger et al 2018; Roovers et al 2002). Arnberger et al's (2018) choice experiment presented visitors (n=522) to the Bavarian Forest National Park (Germany) with six types of trail, varying in surface type and width, and with varied wooden seating opportunities as well as the presence or absence of signposts. The preferred option was a 2m wide trail while respondents disliked both broad forest roads and narrow trails. The presence of seating was important, with preference for a bench or bench-table, followed by a simple log seat. The presence or absence of signage was not important (Arnberger et al, 2018). Visitors to large forests south of Leuven (Belgium) also displayed a preference for wide forest paths, although preferences varied by activity type: walkers, joggers and bikers preferred formal

paths, while horse-riders preferred non-hardened paths. Horse-riders also demonstrated the least need for most other types of facilities (e.g. play areas, parking, toilets) compared with the other three activity groups, although demand for litterbins was high for all users (Table 8) (Roovers et al 2002).

Table 8 Percentage of people stating that different infrastructure items are a 'necessity' in the forest (n=526)

Infrastructure	All activity groups %	Walkers %	Joggers %	Bikers %	Horse riders %
Litterbins	88	88	86	90	81
Hiking routes	84	84	87	82	81
Non-hardened paths	84	88	86	90	81
Information boards	84	86	81	84	81
Biking routes	74	64	78	90	62
Benches	74	78	71	72	57
Play forest	74	74	77	75	68
Open play area	63	61	63	68	51
Watch tower	63	59	57	57	60
Parking	54	56	57	50	43
Hardened paths	53	48	54	65	35
Resting field	52	46	59	55	62
Toilets	38	31	40	50	27
Catering facilities	18	60	80	67	76

Source: Roovers et al, 2002

Other studies explored socio-demographic differences in preferences for facilities and infrastructure. Several studies revealed gendered differences in preferences, with most types of forest infrastructure tending to be more appealing to women than men (Frick et al 2018; de Meo et al 2015). Amongst respondents in Trento

(Italy), women placed greater value than men on the presence of the paths and parking close to the forest; the only artificial facilities more valued by men were refreshment points (de Meo et al 2015). Frick et al (2018) also found that perceptions of forest infrastructure in Switzerland varied with age: older participants were more annoyed by sports infrastructure than younger participants, but had comparatively higher levels of approval for fire sites, educational trails and car parks. In Japan, Zhang et al (2019) found that when choosing a trail, elderly and female visitors were more likely to consider its condition, while young people aged 10–20 years old were more likely to consider its recreational landscape elements (e.g. forest terrain, photography opportunities). Satisfaction levels for litter bins, public toilets and restaurant provision were similar across different segments of visitors to the Thai national forest park; however, overseas visitors were less satisfied with signage and information than other sub-groups, likely because of language barriers (Seebunruang et al 2022).

While many studies provide evidence about preferences for paths and trails, some have focused in depth on differences in preferences for different types of paths. One such study, in a large forest park near Beijing, used a questionnaire with 803 park visitors to delve into this subject (Cai et al, 2021). The authors asked about preferences for four different types of route used for exercise: these were (with n and percentage preferred in brackets), Forest route (290; 34.56%); Built route (216; 25.74%); Waterfront route (150; 17.88%); Mixed route (183; 21.81%). Female respondents preferred mixed routes. In terms of age, residents under the age of 20 and over 40 have a stronger preference for mixed routes. Similarly, families with two people prefer the waterfront route, while families with three tend to choose the mixed route.

5.1.2   Preferences for natural features

Several studies suggest that participants value the 'wilder' aspects of forests, for example preferring fire sites further from forest roads (Hegetschweiler et al 2007). Frick et al's (2018) analysis of responses to a national survey of attitudes towards forests in Switzerland found that although respondents approved of 'pristine' forests in general, many had negative perceptions of specific aspects such as deadwood. Zhang et al (2019) found that preferences of forest visitors in Japan varied with duration of stay: visitors staying over 6 hours preferred natural landscape features, while those visiting for shorter periods had fewer clear preferences, but mainly selected trails based on their suitability for walking in the time available. Respondents in Switzerland preferred forests with water bodies (Frick et al 2018) and preferred fire sites near streams (Hegetschweiler et al 2007). Several studies also suggest that visitors value open space in forests, in the form of clearings (Frick et al 2018), open canopy forest (de Meo et al 2015) and other open spaces (Hegetschweiler et al 2007). However, in Switzerland, women found lighter forests with clearings more appealing than men did (Frick et al 2018). There were also gendered differences in perceptions of natural forest features in Trento (Italy), where men valued panoramic views more than women did (de Meo et al 2015).

5.1.3   Preferences on a spectrum from wild to developed

Several international studies have explored preferences for facilities and features of large forests across a 'natural' to 'developed' continuum. The evidence suggests that while many forest visitors prefer 'wilder' forests with fewer artificial facilities, the majority prefer something in the middle of the scale (Drábková & Šišák 2013; de Meo et al 2015; Fairweather & Swaffield 2003). Drábková and Šišák (2013) surveyed visitors to Blaník Protected Landscape Area (Czech Republic) about their trail preferences, finding that the majority preferred a trail which was maintained but did not have additional equipment. A maintained trail with basic equipment such as benches (more developed), was the second most popular type of forest trail, followed by a more natural-looking trail with minimal equipment and

maintenance (Drábková & Šišák 2013). Respondents in Trento (Italy) were also asked to indicate their preference for forests near trails and with differing numbers of tourists. From these preference questions the authors divided respondents into three segments. The majority (59.1%) preferred forests near trails but with few tourists, while 35.1% appreciated remote forests further from any trails (de Meo et al 2015). Very few indicated that urban forests were their preference. Fairweather and Swaffield (2003) categorised respondents into two groups according to their viewpoints on the 'naturalness' of forest features and facilities in New Zealand. Those with a 'pure nature' viewpoint conceptualised nature as wild and devoid of human presence, and perceived built structures in the forest environment as least 'natural'. This group disliked non-natural features, but accepted infrastructure such as signage, or historic constructions which have been reclaimed by nature. In contrast, the 'cultured nature' viewpoint which was dominant within the sample (67%) perceives people as part of nature; those with this viewpoint saw plantation forestry as less natural than carefully designed, old or hidden buildings within the forest landscape. This group accepted some human intervention in the forest (Fairweather & Swaffield 2003).

Gundersen and Vistad (2016) compared results from a national survey of forest infrastructure preferences with actual usage across 39 forest sites within 5km of urban areas in south east and mid-Norway. Along a continuum from natural (unmarked paths) to developed (paved recreational roads), survey respondents expressed a preference for the least developed infrastructure. However, data from automatic counters revealed an opposite trend in actual usage, with recreational roads receiving the highest number of visitors and unmarked paths the least. This discrepancy does not mean that the survey findings are unreliable; while the public may prefer to use unmarked paths, forest roads may be used more frequently because they are the most accessible. Gundersen and Vistad (2016) also suggest using a zoning system to meet needs and preferences for different levels of

infrastructural intensity along a 'natural - managed' continuum, rather than implementing uniform types of infrastructure across all areas.

5.2 Evidence from the UK and Ireland

The literature on large forests in the UK and Ireland reviewed for this report focuses on preferences for artificial facilities and infrastructure. No studies were found that reviewed the evidence on preferences for other natural features alongside trees in large forest settings.

5.2.1 Preferences for facilities and infrastructure

Christie et al (2007) quantified the wellbeing benefits of improvements to recreational facilities through a choice experiment and contingent behaviour model. Visitors to seven large forest sites across Great Britain were split into four activity categories: cyclists, horse riders, nature watchers and general forest visitors, with sub-categories such as mountain bikers and downhill riders. More specialist forest users were found to benefit more than general forest users from the provision of specialist facilities; for example, downhill cyclists (unsurprisingly) got most benefit from dedicated downhill trails, obstacles, and bike wash facilities. However, numbers of these users tend to be small, meaning that infrastructure provision would not benefit a wide demographic. Results from benefits gained from multipurpose trails suggest that cyclists do not want to share trails with other users. Nature watchers prefer forests with wildlife hides, wildlife viewing centres, and 'off the beaten track nature trails'. Results were inconclusive regarding the value of parking, toilets, picnic areas, cafés and shops for horse riders and general forest users (Christie et al 2007).

In a large forest (Alice Holt Forest), the preferred type of bench was a 'rustic' bench with a backrest made from a fallen log. The most popular barbeque site was a large, covered barbeque area, while a small barbecue area surrounded by grass

(most natural) was least popular. In terms of signage, tall finger posts with icon imagery and text were most popular, while a sign constructed from synthetic materials and with lots of small text was least popular (all findings, Doick et al (2013).

Older people visiting two large destination forest sites valued 'managed' woodlands with facilities such as footpaths, toilets, information boards, benches and car parks as they enabled access and gave them confidence to visit the woodlands (O'Brien, et al, 2014). Age was also found by Doick et al (2013) to significantly affect preferences for design and provision of facilities in Alice Holt Forest.

Morris and O'Brien's (2011) evaluation of the Active England programme, which aims to encourage physical activity in a forest setting, investigated changes in activity levels at three large Forestry Commission sites (Bedgebury, Haldon, Rosliston) which had invested in infrastructure improvements. The authors attribute the high proportion of female visitors to Rosliston to both the provision of child friendly facilities (e.g. play areas) and activities. The three sites saw proportions of visitors from black and minority ethnic (BAME) groups increase following an increase in organised activities through the Active England programme. This suggests that for some socio-demographic groups, targeted and organised activities may be required, alongside infrastructure and facilities, in order for certain groups to feel confident and comfortable visiting woodlands (Morris & O'Brien 2011). For example, O'Brien and Morris (2009, cited in O'Brien & Morris 2013) observe that at Haldon Forest, a 'target intervention' (e.g. dedicated bike rides for women, promotional materials) was key to encouraging women to use the new mountain bike trails. These findings stress the importance of providing 'social infrastructure' alongside artificial facilities, as noted in previous sections of this review.

Further work at Bedgebury in 2017 involving 29 people in four focus groups delved deeper into a range of facilities and infrastructure found at the forest (Hall & O'Brien, 2018). There was much praise for the play areas, and the visitor centre

received unanimous praise and only positive comments. The aspect of the infrastructure that received the least positive comments was the car park. Generally the groups were positive about the fact that there was a mix of footpath surfaces that included some stretches of path that could be used in all weathers and all seasons, with or without children, and with or without buggies. With regard to on-site interpretation people praised the small labels on individual trees. As for the larger interpretation boards, people liked them, appreciated them, and stopped to read them. For those with children old enough to read, they were felt to be a valuable learning resource.

Morris et al's (2011) literature review identified barriers to woodland and forest access for a wide range of 'excluded' groups. The review identified four categories of barrier, including physical and structural barriers. Within these, the authors make a distinction between 'on-site barriers' (the relevant physical attributes of a site, such as access points, signage and facilities) and 'off-site' barriers (e.g. lack of information and lack of public transport). Stiles, gates, toilets and other forest-based facilities and features were found to be an important on-site barrier for wheelchair and mobility scooter users (Morris et al 2011). However, Burns et al's (2009) focus group research with people with disabilities across Great Britain emphasised the importance of ensuring accessibility is not only about providing physical access for wheelchairs (eg. parking bays, disabled toilets, accessible paths), but also providing activities and opportunities, alongside facilities and infrastructure, catering for a wide range of physical and mental impairments, learning difficulties and mental health problems.

6 Conclusions and evidence gaps

This literature review has sought to improve understanding of what 'types' of future forests, woods and urban greenspaces the public want in terms of infrastructure, artificial facilities and natural features alongside trees. The literature has also

revealed important findings about non-physical features and attributes relating to a desire for social space and activities.

6.1 Key findings

Across the three types of location included in this review (urban greenspace with trees; peri-urban woodlands; large visitor forests) there is ample evidence about preferences for seating and paths/trails. However, the range of facilities and infrastructure captured is very broad, and includes: paths, seating, tables, catering outlets, car parking, signage, litter bins, toilets, information, play areas and equipment, sporting equipment and spaces, and more. For example, there is considerable evidence that people like spaces to be clean and tidy, and hence wish to have litter bins provided.

With regard to differences between people and between location types there are numerous important findings. Facilities such as benches and seats were generally shown to be favoured more strongly by older people. Preferences for paths and trails tended to be related to the favoured activity type of individuals. Generally speaking there appears to be greater concern from women for places that feel safe and secure, hence lighting and other security related infrastructure was often higher on their list of preferences. Related to this, women often appear to favour any infrastructure, the implication being that more facilities will mean there are likely to be more people and hence, again, there is a perception that this increases feelings of safety. Parents with small children had mixed preferences with regard to play facilities within woods and forests. While this was often important there was also a recognition that trees, woods and forests themselves provide opportunities for exploration and adventure without the need for artificial play equipment. Signage and information was, unsurprisingly, more important for visitors and tourists to woods and forests than local residents. The evidence around the desire for car parking appears to show that preferences increase based on location, that is, in urban greenspace with trees there is only some small amount of evidence that

this is important to people, but at larger, more distant destination forests there is much greater evidence that the presence of car parking is important to most people.

With regard to other natural features alongside trees, there is much less evidence than that relating to artificial infrastructure. However, there is evidence that in urban parks the preference is often for open spaces with trees around the edges, allowing for social gatherings and other recreational activities. This also helps to generate feelings of greater safety, or minimise concerns about potential hiding places for people perceived to pose a threat. Some people also expressed a wish to see some colourful flowers in their local park, alongside trees and also shrubs and ornamental grasses. Hence, diversity and well kept spaces are important in urban greenspace. Within large visitor forests some people like to see water bodies, and in some cases (particularly women), also favoured some open glades and meadows. Viewpoints are also desired.

Alongside preferences for artificial infrastructure and natural features a third category was evident from the literature, that of social infrastructure. This incorporates organised events and activities, spaces for social gatherings, places for communities to come together, and the presence of other people including staff and security.

6.2 Research gaps

Overall, there is much more literature on artificial facilities and infrastructure, than in relation to other natural features that people like to see alongside trees in any setting. There is more evidence from urban greenspaces with trees and large visitor forests, than peri-urban woodlands. The UK evidence is very much focused on studies in England. While there is a considerable amount of literature discussing preferences for play areas and facilities in parks, woods and forests this is from parents and not the children themselves. The literature from urban greenspaces

with trees is almost entirely based on urban parks, and yet there are many other types of urban greenspaces with trees. This review includes a few studies (hospital grounds for example) but very little was found.

6.3 Concluding points

The breadth of evidence and lack of consistency of methodological approach makes it challenging to find consistent results from the evidence. However, what is consistent is that local communities and visitors to areas with trees often have firm views about what facilities they want (or not). Hence designing new woodlands and creating new spaces with trees needs to draw on the preferences of those likely to be impacted. Given the diversity of views across different groups of people, engaging with a wide variety of social groups is crucial. Recognising that tree'd spaces should incorporate artificial infrastructure, other natural features and importantly 'social infrastructure' to ensure inclusive engagement is vital.

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