Urban Forestry & Urban Greening 9 (2010) 121–128
doi:10.1016/j.ufug.2009.12.001

Peoples' Use of, and Concerns about, Green Space Networks: A Case Study of Birchwood, Warrington New Town, UK.

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Abstract

Cultural services provided by green space networks and in particular leisure and recreational opportunities are central to the quality of life of those living in urban areas. However, the literature concerned with green space networks has mainly focussed on planning aspects rather than on recreational use. The aim of this study was to evaluate the recreational use of, and concerns about, a naturalistic green space network. The case study location was the naturalistic woodland framework in Birchwood, Warrington, UK, known as Birchwood Forest Park. Non-participant observation and content analysis of local archives were used to collect quantitative and qualitative data. Birchwood Forest Park was used more for leisure activities (52.8%, N = 1,825; i.e. recreation, sports or play) than for utilitarian purposes (47.2%, N = 1,825; i.e. as walking or cycling thoroughfare). However, utilitarian walking (30%, N = 1,825) was the most frequent type of activity observed. The maintenance of the naturalistic woodland framework was the most frequent concern mentioned in the local archives (33.3%, N = 234). This case study suggests that the recreational patterns in, as well as peoples' concerns about, naturalistic urban landscapes may be a factor of high quality maintenance and associated local aesthetic and cultural perceptions. In developing, planning or managing comprehensive urban green space networks it is important to ensure that natural looking scenes are well maintained and that the local community is culturally connected to such scenes.

Key words: content analysis, green infrastructure, non-participant observation, recreation, naturalistic landscape

1. Introduction

Urban green space network, in this study, is defined broadly to include physically and/or functionally interconnected formally designated green spaces as well as informal natural areas irrespective of their size, composition or use. Urban green space networks could provide important ecosystem services (Tzoulas et al., 2007; Millennium Ecosystem Assessment, 2005; Bolund and Hunhammar, 1999). Ecosystem services are fundamental ecological processes that support all life on earth. These include the provision of basic commodities (e.g. food, clean air and water resources); the regulation of abiotic and biotic conditions (e.g. climate and spread of diseases); the support of primary production and soil formation; and cultural services (e.g. aesthetic, spiritual and psychological benefits from contact with nature as well as leisure and recreation opportunities; Millennium Ecosystem Assessment, 2005). The recreational activities that take place in urban green spaces are particularly important because they could be linked to both physical health and psychological well-being benefits for people (Maas et al., 2008; Tzoulas et al., 2007).

In the UK the main recreational activities that people engage in when visiting urban green spaces include going for a walk; dog-walking; taking children to play areas; sitting to relax and enjoy nature; playing informal or formal games; walking; cycling; taking exercise; and taking part in social activities and events (GreenSpace, 2007; Mulder et al., 2005; Ward-Thompson, 2005; Bell et al., 2004; Moore, 2003; Dunnett et al., 2002). A common finding amongst surveys of the recreational use of urban green spaces is that sports users are the minority of all users of parks and that informal

activity is more common than formal activity (GreenSpace, 2007; Mulder et al., 2005; Ward-Thompson, 2005; Bell et al., 2004; Moore, 2003; Dunnett et al., 2002).

The potential of green spaces in promoting place identity and in residential preference have also received research attention. Evidence suggests that urban scenes that feature natural elements are preferred over scenes that do not (Ozguner and Kendle, 2006; Ulrich, 1981). However, not all natural views are equally liked. For example views of scattered trees with no dense understorey vegetation are preferred to views with dense understorey (Ulrich, 1993; Kaplan and Kaplan, 1989). Specifically, multilayered woodland edges have been found to be the least preferred option of woodland edge (Jorgensen et al., 2002). Furthermore, there is evidence to suggest that although people may like to visit wild areas they do not like to live in very close proximity to them, preferring well kept landscapes near their homes instead (Nassauer 1995). Consequently, these studies indicate that wild looking woodland type landscapes in close proximity to residential areas may not be liked by urban people. If this is so, would there be different recreational patterns in naturalistic looking landscapes than in well-kept parks?

Some authors have argued that poor outdoor urban design could lead to the loss of community identity; and that enhancing the identity of the physical environment could lead to increased sense of community attachment (Matsuoka and Kaplan, 2008). Also, green spaces could have an important role in promoting community identity when they offer opportunities to the residents to learn about, to get involved in activities in, and to improve their local landscapes (Stewart et al., 2004). Nonetheless, further

research is needed to substantiate the role of urban green space in promoting community identity (Matsuoka and Kaplan, 2008).

Studies on the recreational use of urban green space tend to focus on individual green spaces rather than green space networks. Green space networks are more integrated functionally or physically, and, therefore, may provide more formal and informal recreation opportunities, than individual green spaces. The literature concerned with urban forests, greenbelts and green hearts, green fingers or wedges, greenways, green infrastructure and ecological networks tends to focus on their planning aspects rather than on their recreational use (Opdam et al., 2006; Sandström et al., 2006; Walmsley, 2006; Li et al., 2005; Weber et al., 2005; Frischenbruder and Pellegrino, 2004; Jim and Chen, 2003; Kühn, 2003; Sandstrom, 2002; Konijnendijk, 2000; Schrijnen, 2000; Walmsley, 1995). So, there is little knowledge on the patterns of recreational use of urban green space networks. However, knowledge of recreational use is vital in understanding the multifunctional potential of urban green space networks and in integrating social and ecological systems in land use planning and management (James et al. 2009).

The aim of this study was to contribute knowledge in developing new insights in the planning and management of an urban green space network. The objectives of this study were to collect quantitative and qualitative data through observational and document analysis methods to answer two questions. First, how is the urban green space network used by the local community? Second, what are the local community's concerns about its green space network?

The case study location for this research was Birchwood, Warrington, UK. This is a mixed use suburban area (811 hectares) with 11,395 residents (Office for National Statistics, 2004). Birchwood was one of five districts of Warrington New Town and it was developed during the 1970s and the 1980s. The development of Birchwood was an experiment in urban design where for the first time in the UK naturalistic principles were employed in creating an ecological woodland framework (Jorgensen et al., 2007; Scott, 1991).

The woodland framework was established first and became known as Birchwood Forest Park. This comprised three District Parks, one Golf Course, one Local Nature Reserve, and numerous woodland belts and woodland fingers (Fig 1). The built environment was developed subsequently and included three villages, four business and two soft manufacturing employment areas. The different land uses were separated by woodland belts, which were used to define the boundaries and give character to each area (Scott, 1991). Furthermore, woodland fingers were created to interweave within the built up areas. All the planting in the woodland framework, as well as in the open spaces, involved naturalistic techniques and used indigenous species (Scott, 1991). This has recreated a naturalistic looking landscape, with a variety of habitats including woodlands, ponds, meadows, shrubs and incorporated remnants of moss land.

Figure 1: The case study location showing the main components of Birchwood Forest Park, residential and employment areas, and the routes walked during structured observations

Key: Woodland Belts: small woodland belts and woodland fingers are too fine to show on this scale; **Risley Moss LNR Public:** the part of the Local Nature Reserve that is open to public access; **Risley Moss LNR Restricted:** the part of the Local Nature Reserve that is not open to the public access; **Residential Villages:** Oakwood; Gorse Cover; Locking Stumps; **Business Areas:** Birchwood Shopping Centre; Birchwood Boulevard Business Park; and Birchwood Business and Science Parks; **Soft Manufacturing:** Risley Employment Area including Trident Employment Park; **East Route:** Stating at the train station and heading Eastwards covers the areas of Oakwood, Birchwood Brook Park, the northern part of

Birchwood District Park; Risley Employment Area; Gorse Covert village and Mounds; and Risley Moss Local Nature Reserve (in sequence of visit); **West Route:** Stating at the train station and heading Westwards covers the areas of Birchwood Shopping Centre; Birchwood Boulevard Business Park; Locking Stumps village and Golf Course; Trident Employment Park; Birchwood Business and Science Parks; and the southern part of Birchwood District Park (in sequence of visit); © Crown Copyright/ Database Right 2009. An Ordnance Survey/EDINA supplied service.

Jorgensen et al., (2007) undertook a survey of Birchwood residents to explore the role that the woodland framework played in perceptions of residential satisfaction, safety and place identity. Although the majority of residents in Birchwood liked the visual appearance of their neighbourhoods and woodland featured amongst their most common favourite places, residential satisfaction was not statistically significantly different from that of the control group (Jorgensen, et al., 2007). Furthermore, the control group was significantly less likely to identify local green spaces as unsafe as Birchwood residents were; and the woodland framework (i.e. Birchwood Forest Park) was not identified as an important aspects of the local community's identity (Jorgensen et al., 2007). So, the local community in Birchwood appears to like its naturalistic green space network and to consider it an important favourite place on the one hand, but on the other hand it also considers Birchwood Forest Park as potentially unsafe and not part of the local identity. Could these characteristics be reflected in the recreational patterns in Birchwood Forest Park?

What lessons relevant to the planning and management of urban green space networks could be learned by understanding the recreational use of, and the local community's concerns about, Birchwood Forest Park? Two particular aspects of Birchwood's

wooded landscape make this an extreme example of an urban green space network. First, the recreated woodland framework comprising multilayered vegetation gives to the landscape a natural and wild looking character. Second, natural looking woodland engulfs and woodland fingers interweave through residential areas bringing residents in very close proximity to the green space network.

Selecting extreme examples can be useful in collecting information about special cases that may be particularly good or problematic and in illustrating vividly a point (Flyvbjerg, 2004). Therefore, Birchwood Forest Park is a good case to illustrate the recreational patterns and concerns that may be associated with natural looking landscapes that are well-integrated in residential areas. This knowledge could be useful in informing the planning, design and management of urban green space networks.

2. Methods

Survey and interview methods are often used in studies that are focussed on the recreational use of urban green space. However, methods that do not require the researcher to interact with the study participants may collect data on attitudes and behaviours that are not influenced by the knowledge that these are being studied (O'Reilly, 2005; Robson, 1993). This was an important consideration in this study. Hence, the methods that were used included unstructured and structured observations (O'Reilly, 2005; Robson, 1993) and content analysis of local documents (Bengston et al., 2005; Bickerstaff et al., 2002; Vuorisalo et al., 2001).

2.1 Unstructured observations

This study started with unstructured observations. These aimed to establish possible activity hotspots in, and the variety of activities that took place in different parts of, Birchwood Forest Park. An Ordnance Survey map of Warrington (scale 1: 15,840) was used to identify all main routes and paths within the area (Ordnance Survey, 2000). Initially, these were walked at different days of the week and at different times between 0830hrs and 2030hrs to capture day time outdoor physical activities. During these initial walks hand written notes were made about any observations of activities that were taking place, of the people who were engaged in them, and of the area where the activities were happening. Notes were also kept on weather, date and time, any special occasions and the socio-economic characteristics of the area.

The unstructured observations were undertaken in April 2003. The qualitative data generated from these observations were summarised and grouped into two broad categories of activities: utilitarian and leisure. The former category comprised utilitarian walking and cycling while the latter included twenty types of leisure pursuits under the broad themes of recreation, sport and play activities (Table 1). These were used to create a field record-sheet that was used during the structured observations (Table 2).

Table 1: Definitions of observations of activities used in the structured observations

	Observations of activities	Definition
Utilitarian	Walking/ cycling somewhere	Walking/ cycling at a relative speed and not carrying anything, or just carrying a handbag
	Walking/ cycling to shops	Walking/ cycling to or from the shops and carrying shopping bags full of shopping [(a)]
Recreation	Walking/ cycling the dog	Walking/ cycling and having one or more dogs with them
	Walk/ cycling for leisure	Walking/ cycling at a strolling pace, carrying rucksacks or walking sticks and watching people and surroundings; Also cycling at relative speed and being dressed with cycling gear
	Chatting to people	Two or more people chatting to each other while standing in the streets, paths or in parks
	Relaxing	People sitting on park benches or lying on the grass reading or sunbathing
	Bird watching	People with bird watching equipment who are using bird watching facilities
	Family outing	Young man and woman with at least one child having a picnic or sitting and playing in the park (sometimes with grandparents)
	Collecting flowers	People collecting flowers, berries or sticks
Sport	Football, Golf, Jogging, Skate boarding, Tennis, Flying kites, Frisbee, Cricket	People or groups of people engaging formally or informally in any of these sports and exercise activities alone or in groups
Play	Play in the park	Children climbing trees, making dens in shrubs and running about in green spaces
	Play in a play area	Children playing in any designated play areas
	Play in the street	Children playing seek and hide and/ or running about in the streets

N.B.: (a) Observations of persons walking or cycling to the shops were only made when the subjects were both near enough and had a clear direction towards the shops

Table 2: Example of completed field record sheet used in the structured observations

Date: *21.12.04* **Time:** *11:40 am* **Transect:** *East* **Area:** Science Park											
Actors	Male	*1*	*1*		*2*			*2*	*1*	*1*	
	Female			*1*		*1*	*3*				
	≤10 years old						*2*				
	11 – 18 years old										
	19 – 39 years old	*1*	*1*	*1*	*2*	*1*	*1*			*1*	
	40 – 59 years old							*2*			
	≥ 60 years old								*1*		
Utilitarian	Cycling somewhere										
	Cycling to shops										
	Walking somewhere			*1*		*1*			*1*		
	Walking to shops										
Recreation	Bird watching										
	Chatting to people										
	Collecting flowers										
	Cycling for leisure										
	Cycling with dog										
	Family outing										
	Relaxing										
	Walk for leisure		*1*				*3*	*2*			
	Walking the dog										
Sport	Cricket										
	Flying kites										
	Football										
	Frisbee										
	Golf										
	Jogging	*1*			*2*					*1*	
	Skate boarding										
	Tennis										
Play	Play in a play area										
	Play in the park										
	Play in the street										
Comments: *Very cold but bright and dry weather; no special occasions*											

2.2 Structured observations

Non-participant observation presents the difficulty of interpreting what is been observed. For instance someone walking towards the shops may be going to the shops, or to visit someone living near the shops, or may be strolling for leisure. This difficulty was avoided in this study by clearly defining the criteria by which each observation was categorised and recorded (Table 1). These criteria were defined by summarising, and classifying notes made during the unstructured observations.

The aim of structured observations was to capture the variety of day time recreational activities throughout the week, and at different seasons of the year. Field observations were made according to a simple stratified unaligned sampling strategy (Hill et al., 2005). Firstly, the study area was systematically subdivided into twenty five hectare squares by overlaying a grid on an Ordnance Survey map (scale 1: 15,840; Ordnance Survey, 2000). Twenty three such squares covered the whole study area. Secondly, each one of the twenty five hectare squares was subdivided into one hundred equal sized smaller squares. Thirdly, a table of random digits was used to select x and y sub-coordinates in order to identify a point randomly within each twenty five hectare square.

The resultant twenty three random points were then connected to form two routes one covering the eastern and one covering the western parts of Birchwood Forest Park (Fig 1). These routes were created in a way that captured the variation amongst the residential areas and village centres, the employment areas, the woodland belts and fingers, the local parks and the local nature reserve within the study area. Linking the

points into two routes provided an additional advantage. With the East route being 8.2 km and the West route being 6.3 km long it was possible to walk each of them in 2.5 to 3 hours. This meant that the routes could be walked at different times of day, and thus capture time related changes in recreational activities.

All field visits were made between 0830hrs and 2030hrs on different days and times each week (e.g. if one week field work was planned for Monday and Tuesday the following week it would be planned for Wednesday and Thursday and so on). Field visits were also made during weekends, Bank Holidays, School Holidays and over Christmas and Easter Holidays (UK). Field visits were made irrespective of weather conditions. This allowed complete seasonal coverage of observations during daylight. During observations the age of actors was estimated by making deductions based on their visual appearance.

The routes were walked in the same sequence of areas and both qualitative and quantitative observations were made using an observation field-sheet (Table 2). The East route started at the train station and covered two residential villages, the District Parks (except the southern part of Birchwood District Park), the Local Nature Reserve and Risley Employment Area. The West route started at the train station and covered the business parks, the remaining residential village, the golf course, the southern part of Birchwood District Park, and the Trident Employment Park (Fig 1). Each route was visited an average twice a week and a total of 136 visits for structured observations were made between May 2003 and February 2005.

An observation comprised an individual being involved in a recreational activity in any part of Birchwood Forest Park. People being involved in group activities were recorded as separate observations (e.g. if three females of different age were walking for leisure their age group would be recorded individually and the activity would be recorded three times; Table 2). While many of the single observations were recorded on the field record while walking, near popular recreational areas where there were often simultaneous and/ or group activities the observer stopped to make and record the observations. Throughout the field work, and especially when it was necessary to stop and keep notes, observations were done discreetly to ensure that people did not feel that they were being observed.

2.3 Local documents content analysis

Content analysis of local documents has been used to explore peoples' attitudes and behaviours towards their local environment (Vuorisalo et al., 2001); to evaluate experiences of public participation processes (Bickerstaff et al., 2002); and to evaluate changing attitudes of the public towards urban sprawl (Bengston et al., 2005). Therefore, this method can be used to find out about different aspects of a local community. For this study the content analysis of local documents was designed to explore in an unobtrusive way the local community's concerns about its green space network.

The document content analysis sought to cover the widest possible representation of the population and reflect recent views at the time of the study. Hence, the sample included archives of local newsletters and meetings minutes between 2002 and 2005

(reflecting the time span of this research project). The archives covered all main interest groups of the area (i.e. residential, local community, business and conservation; Table 3). The complete archives were collected by contacting the respective organisation or local group.

Table 3: Local archives used in the content analysis study

Group	Type of archive	Group Interest
Birchwood Town Council	Meeting minutes	Local community
REPG [(a)]	Meeting minutes	Open spaces
Risley Moss LNR [(b)]	Newsletter	Open spaces
The Birchwood Forum	Meeting minutes	Business
The Birchwood Forum	Newsletter	Business
The Birchwood Partnership	Meeting minutes	Local community

N.B: All archives covered the period 2002 to 2005; **(a)** Risley Environmental Protection Group; **(b)** Local Nature Reserve

The local archives were from local community, voluntary and business groups that aim to improve the local area and so they concentrated mainly on negative rather than positive aspects of the local area. This is why these archives were a good source for collecting information about local concerns relating to Birchwood Forest Park. Furthermore, the meetings in Birchwood Town Council, Birchwood Forum and Birchwood Partnership were often attended by key local decision makers and so were less likely to reflect misinformed views about the area.

A sample comprising three issues of each archive was initially read and this revealed quotes that could be grouped into five categories of concern about Birchwood Forest

Park (Table 4). During the content analysis the local archives were read, and by using a record sheet quotes about each different category of concern were recorded. This produced both quantitative and qualitative information about concerns relating to Birchwood Forest Park.

Table 4: Definitions of categories of concern used in the local document analysis

Concern category	Definition
Facilities maintenance	Restoring vandalised or worn out park facilities such as benches, litterbins, signs, play and sport areas and vandalism on the visitor centre or other buildings
Woodland maintenance	Woodland maintenance needs, costs of maintenance, street cleansing, landscaping issues, local wildlife related concerns, trees and shrubs causing obstructed views
Litter	Litter issues along paths, in shrubs, along some streets and abandoned trolleys
Paths	Broken street and path lights, condition of paths, requests for, and concerns about, footpath closures
Dog mess	Mentions of dog mess issues, dog litter bins and relevant bylaws

The quantitative data produced by the observational and content analysis studies were summarised by descriptive statistics using Microsoft Excel XP® Professional Edition 2001. The qualitative data that was produced by these methods were used to add understanding to the interpretation of the quantitative data.

3. Results

3.1 Observational study

During the observational study 1,825 observations were made, of people using Birchwood Forest Park, and of these 61% were male and 39% were female (Table 5). The proportion of females noted in the survey is lower than that reported in other surveys (e.g. Moore, 2003) and could be due to perceived safety issues in Birchwood (Jorgensen et al., 2007).

Table 5: Sex and age of people observed to use Birchwood Forest Park

Sex & Age [(a)]	**Frequency**	**Percent (N=1825)**
Male	1113	61.0
Female	712	39.0
Sum	*1825*	*100*
≤10 years old	315	17.3
11 – 18 years old	210	11.5
19 – 39 years old	687	37.6
40 – 59 years old	410	22.5
≥ 60 years old	203	11.1
Sum	*1825*	*100*

(a) Age is based on visual estimates

People in the age group between nineteen and thirty nine years old used Birchwood Forest Park more than any other age group (37.6%, N = 1,825; Table 5). Teenagers (11.5%) and people over sixty years old (11.1%) were the least observed groups using the local urban green space network.

What do the local residents use the green space in Birchwood for? Forty seven point two percent (N = 1,825) of the activity observed was for utilitarian purposes such as walking or cycling to, or returning from, the local shops or another destination (Table 6). This proportion of utilitarian use may reflect that residents are using the well interconnected network of paths through woodland belts for going to places.

Nine types of recreational activities were observed and these collectively represented the second most popular group of activities taking place in the green spaces in Birchwood (29.1%, N = 1,825; Table 6). The most frequent recreational activities were dog walking (8.9%), walking for leisure (8.3%) and standing or sitting to discuss with acquaintances or friends (4.9%). So, walking seems to be a main group of recreational activities in a naturalistic green space network as it is in other types of urban green space (Ward-Thompson, 2005; Bell et al., 2004; Moore, 2003; Dunnett et al., 2002).

Eight sporting and exercise activities were observed in Birchwood Forest Park (17.2%, N = 1,825; Table 6). However, two of these activities were only observed twice (i.e. flying Frisbee and playing cricket). The most frequent types of sport that were observed were football (6.5%) and golf (5.4%). This may be indicative of the lack of other sports facilities in the area.

Table 6: Types of public use observed to take place in Birchwood Forest Park

	Activities Grouped	**Frequency**	**Percent (N = 1825)**
	Utilitarian	861	47.2
	Recreation	531	29.1
	Sport	314	17.2
	Play	119	6.5
	Sum	1825	100
	Activities Detailed	**Frequency**	**Percent (N = 1825)**
Utilitarian	Walking somewhere	547	30.0
	Walking to shops	198	10.8
	Cycling somewhere	108	5.9
	Cycling to shops	8	0.4
Recreation	Walking the dog	162	8.9
	Walk for leisure	152	8.3
	Chatting to people	89	4.9
	Cycling for leisure	47	2.6
	Relaxing	35	1.9
	Bird watching	17	0.9
	Family outing	11	0.6
	Cycling with dog	9	0.5
	Collecting flowers	9	0.5
Sport	Football	119	6.5
	Golf	98	5.4
	Jogging	47	2.6
	Skate boarding	29	1.6
	Tennis	10	0.5
	Flying kites	7	0.4
	Frisbee	2	0.1
	Cricket	2	0.1
Play	Play in the park	56	3.1
	Play in a play area	34	1.9
	Play in the street	29	1.6
	Sum	*1825*	*100*

Although children younger than ten years old were the third most populous group observed (17.3%, N = 1,825; Table 5) play activity was the least observed of all activities (6.5%; Table 6). Nonetheless, the most frequent type of play activity observed was taking place in a local green space and included climbing trees, making dens in shrubs and running about in green spaces (3.1%).

3.2 Local documents analysis

Two hundred and thirty four quotes about concerns relating to Birchwood Forest Park were found in the local archives (Table 7). The most common concerns were about the maintenance of the woodland framework (33.3%; N = 234) and about restoring vandalised park facilities (23.9%; Table 7). Overgrowth of shrubs and trees was seen as obscuring views and lights, and potentially as unsafe. Furthermore, worn out or vandalised park facilities such as sports areas and benches were seen as unwelcoming.

Table 7: Mentions in the local archives of concerns associated with Birchwood Forest Park

Categories of concern	**Frequency**	**Percent (N = 234)**
Woodland maintenance	78	33.3
Facilities maintenance	56	23.9
Litter	47	20.1
Paths	47	20.1
Dog mess	6	2.6
Sum	234	100

Other green space concerns related mainly to litter and to poor path conditions (20.1% each, N = 234) as well as to dog mess (2.6%; Table 7). Litter and dog mess are common issues associated with urban green spaces (Ward-Thompson, 2005; Bell et al., 2004; Moore, 2003; Dunnett et al., 2002; Todorovic and Wellington, 2000). However, poor path lights are an issue particularly relevant to Birchwood Forest Park, which has an extensive network of paths that often are overgrown. These conditions did not seem to make the paths welcoming.

4. Discussion

This study used the unobtrusive methods of non-participant observation and of content analysis of local archives to evaluate what types of activities people undertake in, and what concerns they have about, a naturalistic urban green space network. Collectively there was more leisure than utilitarian activities observed in Birchwood's green spaces. However, when leisure is split into more specific activities such as recreation, sport and play, it becomes evident that utilitarian walking and cycling outnumber any other type of activity (Table 6). Although twenty types of leisure activities were recorded the majority of these were observed quite infrequently at less than a hundred times each over a period of two and half years.

Recreational activities like walking the dog or walking for leisure are often the most common in urban green spaces and woodlands (Ward-Thompson, 2005; Bell et al., 2004; Moore, 2003; Dunnett et al., 2002; Todorovic and Wellington, 2000). Walking the dog or walking for leisure were also the most frequently observed activities in Birchwood Forest Park, indicating that there may be no difference in the patterns of

recreational walking in naturalistic looking landscapes and in other types of urban green space.

The decision on whether to use urban green space or not for recreation may be influenced by social and cultural factors (Snape and Binks, 2008; Sasidharan et al., 2005), by individual preferences, or by the availability of alternative forms of recreation. (Mulder et al., 2005). McDonald and Price (2009) identified a number of reasons why people did not visit urban parks including not being a priority compared to shopping or other leisure activities; lack of variety of leisure opportunities in parks; access difficulties; and failed promotional efforts. Furthermore, people who do not use parks or woodlands may do so because they are not interested (Moore, 2003) or because of other perceptions of personal insecurity (Jorgensen et al., 2007). Factors like these may explain the range and frequency of recreational activities observed in Birchwood Forest Park. However, more detailed studies are needed to establish exactly which factors are in place and their relative significance in determining recreational choices in urban green space networks.

Although sport users are often a minority in public parks (Ward-Thompson, 2005; Bell et al., 2004) in Birchwood they seemed to be a populous minority. The types of sports and exercise that were seen in Birchwood's green spaces reflected the availability of public sports facilities. The Locking Stumps Golf Course and the playing fields and the skate park in Birchwood District Park (Fig 1) are the only public sports facilities in the area and this may explain the frequency of these types of sports. At one time there had been greater provision of sports facilities as two basketball courts, now both derelict and vandalised, were seen (Fig 1). This may be

reflecting changing personal choices of sports and/ or budgetary cuts in the maintenance of sports facilities. So, the choice of sport or exercise in Birchwood may be influenced by personal choice (Bandura, 2001), social perceptions (Ajzen, 1991) and access to facilities.

Smith et al., (1997) proposed a conceptual model that linked urban form characteristics and community quality. The three most important design criteria having the strongest relationship to physical activity were walkable spaces, outdoor amenities and available seating (Smith et al., 1997). In another study King et al., (2000) were able to correlate enjoyable scenery in neighbourhoods with more physical activity. The scenery in Birchwood Forest Park is primarily dominated by multilayered and wild looking woodland edges, which are in very close proximity to houses. Some evidence suggests that multilayered woodland edges (Jorgensen et al., 2002) and wild looking landscapes close to homes (Nassauer, 1995) are least preferred amongst urban people. Furthermore, a study has found that the presence of the woodland framework did not make Birchwood residents like their residential scenes more than people who did not live in this area (Jorgensen et al., 2007). Therefore, the recreational patterns in Birchwood Forest Park characterised by a wide range of mostly infrequent activities may be reflecting the local community's contradictory perceptions of its green space network of both liking it on the one hand and perceiving it as potentially unsafe on the other (Jorgensen et al., 2007).

Since personal choices (Bandura, 2001) and social perceptions (Ajzen, 1991) may be central in determining visual preference, it may be that the local community in Birchwood is not well connected culturally with its Forest Park. Indeed, Jorgensen et

al., (2007) found that the woodland framework in Birchwood was not identified by local residents as a feature of community identity. This may be due the wild looking woodland edges being perceived by the local residents as signs of poor maintenance rather than signs of community care (Nassauer, 1995). Some authors have argued that for innovative residential ecological designs to be successful it is important to establish a threshold of cultural engagement amongst urban communities (Nassauer et al., 2009). So, it may be that if the local residents in Birchwood were more culturally integrated with the woodland framework than they are now they would identify it as part of their community identity as well as using it more frequently for recreational activities. Anthropological studies of the cultural meanings of Birchwood Forest Park for its residents are needed to clarify how the local community relates to its naturalistic landscape.

Issues that often raise concern in relation to the use of urban green space and community woodlands include dog mess, litter and vandalism (Ward-Thompson, 2005; Bell et al., 2004; Moore, 2003; Dunnett et al., 2002; Todorovic and Wellington, 2000). Restoring vandalised facilities and too much litter were also identified as main concerns relating to Birchwood Forest Park (Table 7). Dog mess was also identified as a concern but less frequently so. Therefore, these types of concern seem to be common amongst different types of urban green space.

On the other hand the concerns about maintaining the overgrowth of woodland edges and poor lighting and conditions along paths are issues particularly relevant to Birchwood. Birchwood Forest Park is an extreme example of an urban green space network characterised by wild looking and interconnected multilayered woodland

edges that engulf and interweave through residential areas. So, the concerns revealed in the local archives about the maintenance of the woodland framework and about the paths may also be relevant to other naturalistic looking landscapes and interconnected green space networks.

Using Birchwood Forest Park as a special case of a green space network, which is particularly naturalistic in its outlook, has illustrated vividly two points that are relevant to other New Towns or other urban areas with similar comprehensive green space networks such as Garden Cities, Community Forest areas and potentially new Eco Towns in the UK (Communities and Local Government, 2009). First, comprehensive and natural looking woodland frameworks may raise specific woodland and path maintenance concerns. Second, it is important to have an understanding of the cultural and aesthetic factors that influence the frequency and choice of recreational activities in naturalistic residential areas. So, in developing, planning or managing comprehensive green space networks it is important to ensure that appropriate views and visual penetration through the woodland edges are allowed (Jorgensen et al., 2004), that the scenes are well kept and maintained (Nassauer 1995), and that the local community is culturally connected with its ecological design (Nassauer et al., 2009).

5. Conclusions

In the case study presented in this paper the recreational use of, and concerns about, an extreme example of a green space network have been evaluated by using observational and document analysis methods. Although observations may reveal

what recreational activities may take place they cannot reveal the reasons why these activities might be chosen over other activities. So, although it was been possible to evaluate the range of day time activities and their frequency in Birchwood Forest Park it was not possible to evaluate why these were taking place. Further anthropological studies could provide evidence on the reasons for the observed recreational patterns. Furthermore, the types of archives used in document analysis will limit the type of information that can be gained from them. In this case archives from local community, business and voluntary groups were selected and these were good sources of the local community's concerns about its living and working environments. However, incorporating focus-group and/or in-depth interviews with a random sample of the local population could provide more detailed qualitative data than document analysis alone. Despite the limitations of the methodology the Birchwood case study captures the recreational patterns in a naturalistic and interconnected urban green space network as well as the main concerns that may be associated with such a landscape.

6. References

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