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.

Konstantinos TZOULAS[a], Philip JAMES[b],

a) Corresponding author: School of Environment and Life Sciences, Peel Building, The University of Salford, Greater Manchester, M5 4WT, UK,

Tel: +44(0) 161 295 2133, Fax: +44(0) 161 295 5015, k.tzoulas@salford.ac.uk

b) School of Environment and Life Sciences, Peel Building, The University of Salford, Greater Manchester, M5 4WT, UK

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

100 research is needed to substantiate the role of urban green space in promoting
101 community identity (Matsuoka and Kaplan, 2008).
102
103 Studies on the recreational use of urban green space tend to focus on individual green
104 spaces rather than green space networks. Green space networks are more integrated
105 functionally or physically, and, therefore, may provide more formal and informal
106 recreation opportunities, than individual green spaces. The literature concerned with
107 urban forests, greenbelts and green hearts, green fingers or wedges, greenways, green
108 infrastructure and ecological networks tends to focus on their planning aspects rather
109 than on their recreational use (Opdam et al., 2006; Sandström et al., 2006; Walmsley,
110 2006; Li et al., 2005; Weber et al., 2005; Frischenbruder and Pellegrino, 2004; Jim
111 and Chen, 2003; Kühn, 2003; Sandstrom, 2002; Konijnendijk, 2000; Schrijnen, 2000;
112 Walmsley, 1995). So, there is little knowledge on the patterns of recreational use of
113 urban green space networks. However, knowledge of recreational use is vital in
114 understanding the multifunctional potential of urban green space networks and in
115 integrating social and ecological systems in land use planning and management
116 (James et al. 2009).
117
118 The aim of this study was to contribute knowledge in developing new insights in the
119 planning and management of an urban green space network. The objectives of this
120 study were to collect quantitative and qualitative data through observational and
121 document analysis methods to answer two questions. First, how is the urban green
122 space network used by the local community? Second, what are the local community's
123 concerns about its green space network?
124

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).

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

241

	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

242

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

246

247

248 **Table 2:** Example of completed field record sheet used in the structured observations
249

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*											

250

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

276 points into two routes provided an additional advantage. With the East route being
277 8.2 km and the West route being 6.3 km long it was possible to walk each of them in
278 2.5 to 3 hours. This meant that the routes could be walked at different times of day,
279 and thus capture time related changes in recreational activities.
280
281 All field visits were made between 0830hrs and 2030hrs on different days and times
282 each week (e.g. if one week field work was planned for Monday and Tuesday the
283 following week it would be planned for Wednesday and Thursday and so on). Field
284 visits were also made during weekends, Bank Holidays, School Holidays and over
285 Christmas and Easter Holidays (UK). Field visits were made irrespective of weather
286 conditions. This allowed complete seasonal coverage of observations during daylight.
287 During observations the age of actors was estimated by making deductions based on
288 their visual appearance.
289
290 The routes were walked in the same sequence of areas and both qualitative and
291 quantitative observations were made using an observation field-sheet (Table 2). The
292 East route started at the train station and covered two residential villages, the District
293 Parks (except the southern part of Birchwood District Park), the Local Nature Reserve
294 and Risley Employment Area. The West route started at the train station and covered
295 the business parks, the remaining residential village, the golf course, the southern part
296 of Birchwood District Park, and the Trident Employment Park (Fig 1). Each route
297 was visited an average twice a week and a total of 136 visits for structured
298 observations were made between May 2003 and February 2005.
299

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.

425 **Table 6:** Types of public use observed to take place in Birchwood Forest Park
426

	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*

427

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

454 Other green space concerns related mainly to litter and to poor path conditions (20.1%
455 each, N = 234) as well as to dog mess (2.6%; Table 7). Litter and dog mess are
456 common issues associated with urban green spaces (Ward-Thompson, 2005; Bell et
457 al., 2004; Moore, 2003; Dunnett et al., 2002; Todorovic and Wellington, 2000).
458 However, poor path lights are an issue particularly relevant to Birchwood Forest Park,
459 which has an extensive network of paths that often are overgrown. These conditions
460 did not seem to make the paths welcoming.
461
462 **4. Discussion**
463
464 This study used the unobtrusive methods of non-participant observation and of
465 content analysis of local archives to evaluate what types of activities people undertake
466 in, and what concerns they have about, a naturalistic urban green space network.
467 Collectively there was more leisure than utilitarian activities observed in Birchwood's
468 green spaces. However, when leisure is split into more specific activities such as
469 recreation, sport and play, it becomes evident that utilitarian walking and cycling
470 outnumber any other type of activity (Table 6). Although twenty types of leisure
471 activities were recorded the majority of these were observed quite infrequently at less
472 than a hundred times each over a period of two and half years.
473
474 Recreational activities like walking the dog or walking for leisure are often the most
475 common in urban green spaces and woodlands (Ward-Thompson, 2005; Bell et al.,
476 2004; Moore, 2003; Dunnett et al., 2002; Todorovic and Wellington, 2000). Walking
477 the dog or walking for leisure were also the most frequently observed activities in
478 Birchwood Forest Park, indicating that there may be no difference in the patterns of

479 recreational walking in naturalistic looking landscapes and in other types of urban
480 green space.
481
482 The decision on whether to use urban green space or not for recreation may be
483 influenced by social and cultural factors (Snape and Binks, 2008; Sasidharan et al.,
484 2005), by individual preferences, or by the availability of alternative forms of
485 recreation. (Mulder et al., 2005). McDonald and Price (2009) identified a number of
486 reasons why people did not visit urban parks including not being a priority compared
487 to shopping or other leisure activities; lack of variety of leisure opportunities in parks;
488 access difficulties; and failed promotional efforts. Furthermore, people who do not use
489 parks or woodlands may do so because they are not interested (Moore, 2003) or
490 because of other perceptions of personal insecurity (Jorgensen et al., 2007). Factors
491 like these may explain the range and frequency of recreational activities observed in
492 Birchwood Forest Park. However, more detailed studies are needed to establish
493 exactly which factors are in place and their relative significance in determining
494 recreational choices in urban green space networks.
495
496 Although sport users are often a minority in public parks (Ward-Thompson, 2005;
497 Bell et al., 2004) in Birchwood they seemed to be a populous minority. The types of
498 sports and exercise that were seen in Birchwood's green spaces reflected the
499 availability of public sports facilities. The Locking Stumps Golf Course and the
500 playing fields and the skate park in Birchwood District Park (Fig 1) are the only
501 public sports facilities in the area and this may explain the frequency of these types of
502 sports. At one time there had been greater provision of sports facilities as two
503 basketball courts, now both derelict and vandalised, were seen (Fig 1). This may be

504 reflecting changing personal choices of sports and/ or budgetary cuts in the
505 maintenance of sports facilities. So, the choice of sport or exercise in Birchwood may
506 be influenced by personal choice (Bandura, 2001), social perceptions (Ajzen, 1991)
507 and access to facilities.
508
509 Smith et al., (1997) proposed a conceptual model that linked urban form
510 characteristics and community quality. The three most important design criteria
511 having the strongest relationship to physical activity were walkable spaces, outdoor
512 amenities and available seating (Smith et al., 1997). In another study King et al.,
513 (2000) were able to correlate enjoyable scenery in neighbourhoods with more physical
514 activity. The scenery in Birchwood Forest Park is primarily dominated by
515 multilayered and wild looking woodland edges, which are in very close proximity to
516 houses. Some evidence suggests that multilayered woodland edges (Jorgensen et al.,
517 2002) and wild looking landscapes close to homes (Nassauer, 1995) are least
518 preferred amongst urban people. Furthermore, a study has found that the presence of
519 the woodland framework did not make Birchwood residents like their residential
520 scenes more than people who did not live in this area (Jorgensen et al., 2007).
521 Therefore, the recreational patterns in Birchwood Forest Park characterised by a wide
522 range of mostly infrequent activities may be reflecting the local community's
523 contradictory perceptions of its green space network of both liking it on the one hand
524 and perceiving it as potentially unsafe on the other (Jorgensen et al., 2007).
525
526 Since personal choices (Bandura, 2001) and social perceptions (Ajzen, 1991) may be
527 central in determining visual preference, it may be that the local community in
528 Birchwood is not well connected culturally with its Forest Park. Indeed, Jorgensen et

529 al., (2007) found that the woodland framework in Birchwood was not identified by
530 local residents as a feature of community identity. This may be due the wild looking
531 woodland edges being perceived by the local residents as signs of poor maintenance
532 rather than signs of community care (Nassauer, 1995). Some authors have argued that
533 for innovative residential ecological designs to be successful it is important to
534 establish a threshold of cultural engagement amongst urban communities (Nassauer et
535 al., 2009). So, it may be that if the local residents in Birchwood were more culturally
536 integrated with the woodland framework than they are now they would identify it as
537 part of their community identity as well as using it more frequently for recreational
538 activities. Anthropological studies of the cultural meanings of Birchwood Forest Park
539 for its residents are needed to clarify how the local community relates to its
540 naturalistic landscape.
541
542 Issues that often raise concern in relation to the use of urban green space and
543 community woodlands include dog mess, litter and vandalism (Ward-Thompson,
544 2005; Bell et al., 2004; Moore, 2003; Dunnett et al., 2002; Todorovic and Wellington,
545 2000). Restoring vandalised facilities and too much litter were also identified as main
546 concerns relating to Birchwood Forest Park (Table 7). Dog mess was also identified
547 as a concern but less frequently so. Therefore, these types of concern seem to be
548 common amongst different types of urban green space.
549
550 On the other hand the concerns about maintaining the overgrowth of woodland edges
551 and poor lighting and conditions along paths are issues particularly relevant to
552 Birchwood. Birchwood Forest Park is an extreme example of an urban green space
553 network characterised by wild looking and interconnected multilayered woodland

554 edges that engulf and interweave through residential areas. So, the concerns revealed
555 in the local archives about the maintenance of the woodland framework and about the
556 paths may also be relevant to other naturalistic looking landscapes and interconnected
557 green space networks.
558
559 Using Birchwood Forest Park as a special case of a green space network, which is
560 particularly naturalistic in its outlook, has illustrated vividly two points that are
561 relevant to other New Towns or other urban areas with similar comprehensive green
562 space networks such as Garden Cities, Community Forest areas and potentially new
563 Eco Towns in the UK (Communities and Local Government, 2009). First,
564 comprehensive and natural looking woodland frameworks may raise specific
565 woodland and path maintenance concerns. Second, it is important to have an
566 understanding of the cultural and aesthetic factors that influence the frequency and
567 choice of recreational activities in naturalistic residential areas. So, in developing,
568 planning or managing comprehensive green space networks it is important to ensure
569 that appropriate views and visual penetration through the woodland edges are allowed
570 (Jorgensen et al., 2004), that the scenes are well kept and maintained (Nassauer
571 1995), and that the local community is culturally connected with its ecological design
572 (Nassauer et al., 2009).
573
574 **5. Conclusions**
575
576 In the case study presented in this paper the recreational use of, and concerns about,
577 an extreme example of a green space network have been evaluated by using
578 observational and document analysis methods. Although observations may reveal

579 what recreational activities may take place they cannot reveal the reasons why these
580 activities might be chosen over other activities. So, although it was been possible to
581 evaluate the range of day time activities and their frequency in Birchwood Forest Park
582 it was not possible to evaluate why these were taking place. Further anthropological
583 studies could provide evidence on the reasons for the observed recreational patterns.
584 Furthermore, the types of archives used in document analysis will limit the type of
585 information that can be gained from them. In this case archives from local
586 community, business and voluntary groups were selected and these were good sources
587 of the local community's concerns about its living and working environments.
588 However, incorporating focus-group and/or in-depth interviews with a random sample
589 of the local population could provide more detailed qualitative data than document
590 analysis alone. Despite the limitations of the methodology the Birchwood case study
591 captures the recreational patterns in a naturalistic and interconnected urban green
592 space network as well as the main concerns that may be associated with such a
593 landscape.
594
595
596 **6. References**
597
598 Ajzen, I., 1991. The theory of planned behaviour. Organisational Behaviour and
599 Human Decision Processes 50, 179-211.
600
601 Bandura, A., 2001. Social cognitive theory: an agentic perspective. Annual Review of
602 Psychology 52, 1-26.
603

Bell, S., Morris, N., Findlay, C., Travlou, P., Montarzino, A., Gooch, D., Gregory, G., Ward-Thompson, C., 2004. Nature for people: the importance of green spaces to East Midlands communities. English Nature Research Reports no. 567. English Nature, Peterborough.

Bengston, D.N., Potts, R.S., Fan, D.P., Goetz, E.G., 2005. An Analysis of the public discourse about urban sprawl in the United States: monitoring concern about a major threat to forests. Forest Policy and Economics 7, 745– 756.

Bickerstaff, K., Tolley, R., Walker, G., 2002. Transport planning and participation: the rhetoric and realities of public involvement. Journal of Transport Geography 10, 61–73.

Bolund, P., Hunhammar, S., 1999. Ecosystem services in urban areas. Ecological Economics 29, 293–301.

Communities and Local Government, 2009. Planning policy statement: eco-towns: a supplement to planning policy statement 1. UK Government Department for Communities and Local Government, London.

Dunnett, N., Swanwick, C., Wooley, H.., 2002. Improving urban parks, play areas and open spaces. UK Government Department of Transport, Local Government and the Regions; London.

628 Flyvbjerg, B., 2004. Five misunderstandings about case-study research. In Seale, C.,
629 Gobo, G., Gubrium, J.F., Silverman, D., (Eds.), 2004 Qualitative Research Practice.
630 Sage, London and Thousand Oaks, pp. 420-434.
631
632 Frischenbruder, M.T., Pellegrino, P., 2004. Using greenways to reclaim nature in
633 Brazilian cities. Landscape and Urban Planning 76, 67-78.
634
635 GreenSpace, 2007. The Park Life report. GreenSpace, Reading.
636
637 Hill, D., Fasham, M., Tucker, G., Shewry, M., Shaw, P., (Eds.) 2005. Handbook of
638 biodiversity methods: survey, evaluation and monitoring. Cambridge University
639 Press, Cambridge.
640
641 James, P., Tzoulas, K., Adams, M.D., Barber, A., Box, J., Breuste, J., Elmqvist, T.,
642 Frith, M., Gordon, C., Greening, K.L., Handley, J., Haworth, S., Kazmierczak, A.E.,
643 Johnston, M., Korpela, K., Moretti, M., Niemelä, J., Pauleit, S., Roe, M.H., Sadler,
644 J.P., Ward Thompson, C., 2009. Towards an integrated understanding of green space
645 in the European built environment. Urban Forestry and Urban Greening, 8, 2, 65-75.
646
647 Jim, C.Y., Chen, S.S., 2003. Comprehensive green space planning based on landscape
648 ecology principles in compact Nanjing city, China. Landscape and Urban Planning
649 65, 95–116.
650

651 Jorgensen, A., 2004. The social and cultural context of ecological plantings. In
652 Dunnett, N., Hitchmough, J. (Eds.), 2004 The Dynamic Landscape. Spon, London,
653 pp. 416-458.
654
655 Jorgensen, A., Hitchmough, J., Calvert, T., 2002. Woodland spaces and edges: their
656 impact on perception of safety and preference. Landscape and Urban Planning 60,
657 135–150.
658
659 Jorgensen, A., Hitchmough, J., Dunnett N., 2007. Woodland as a setting for housing
660 appreciation and fear and the contribution to residential satisfaction and place identity
661 in Warrington New Town, UK. Landscape and Urban Planning 79, 273–287.
662
663 Kaplan, R., Kaplan, S., 1989. The experience of nature: a psychological perspective.
664 Cambridge University Press, Cambridge
665
666 King, A.C., Castro, C., Wilcox, S., Eyler, A.A., Sallis, J.F., Brownson, R.C., 2000.
667 Personal and environmental factors associated with physical inactivity among
668 different racial-ethnic groups of U.S. middle-aged and older-aged women. Health
669 Psychology 19, 4, 354-364.
670
671 Konijnendijk, C.C., 2000. Adapting forestry to urban demands: the role of
672 communication in urban forestry in Europe. Landscape and Urban Planning 52, 89-
673 100.
674

675 Kühn, M., 2003. Greenbelt and green heart: separating and integrating landscapes in
676 European city regions. Landscape and Urban Planning 64, 19–27.
677
678 Li, F., Wang, R., Paulussen, J., Liu, X., 2005. Comprehensive concept panning of
679 urban greening based on ecological principles: a case study in Beijing, China.
680 Landscape and Urban Planning 72, 325-336.
681
682 Maas, J., Verheij, R.A., Spreeuwenberg, P., Groenewegen, P.P., 2008. Physical
683 activity as a possible mechanism behind the relationship between green space and
684 health: a multilevel analysis. BMC Public Health 8: 206 doi:10.1186/1471-2458-8-
685 206.
686
687 Matsuoka, R.H., Kaplan, R., 2008. People needs in the urban landscape: analysis of
688 Landscape and Urban Planning contributions. Landscape and Urban Planning 84; 7–
689 19.
690
691 McDonald, S.M., Price, G.G., 2009. Addressing declining metropolitan park use: a
692 case study of Melbourne, Victoria, Australia. Managing Leisure 14, 1, 28-37.
693
694 Millennium Ecosystem Assessment, 2005. Ecosystems and human well-being:
695 synthesis. Island Press; Washington DC
696
697 Moore, S., 2003. The use of public parks in England. Sport England, Countryside
698 Agency and English Heritage; s.l.
699

700 Mulder, C., Shibli, S., Hale, J., 2005. Young people's demand for countryside
701 recreation: a function of supply, tastes and preferences? Managing Leisure 10, 2, 106
702 - 127.
703
704 Nassauer, J.I., 1995. Messy ecosystems, orderly frames. Landscape Journal 14, 161–
705 170.
706
707 Nassauer, J.I., Wang, Z., Dayrell, E., 2009. What will the neighbours think? Cultural
708 norms and ecological design. Landscape and Urban Planning 92; 282-292.
709
710 O'Reilly, K., 2005. Ethnographic methods. Routledge, London.
711
712 Office for National Statistics, 2004. Census 2001: key statistics for urban areas in the
713 North. Office for National Statistics and The Stationary Office; London.
714
715 Opdam, P., Steingrover, E., van Rooij, S., 2006. Ecological networks: a spatial
716 concept for multi-actor planning of sustainable landscapes. Landscape and Urban
717 Planning 75, 322–332.
718
719 Ordnance Survey, 2000. Warrington street A-Z atlas. 2nd Ed. Ordnance Survey,
720 Sevenoaks.
721
722 Ozguner, H., Kendle, A. D., 2006. Public attitudes towards naturalistic versus
723 designed landscapes in the city Sheffield (UK). Landscape and Urban Planning 74;
724 139-157.

725

726 Robson, C., 1993. Real world research: a resource for social scientists and
727 practitioner-researchers. Blackwell Publishers, Oxford.

728

729 Sandström, U.F., 2002. Green infrastructure planning in urban Sweden. Planning
730 Practice and Research 17, 4, 373–385.

731

732 Sandström, U.G., Angelstam, P., Khakee, A., 2006. Urban comprehensive planning:
733 identifying barriers for the maintenance of functional habitat networks. Landscape and
734 Urban Planning 75, 43–57.

735

736 Sasidharan, V., Willits, F., Godbey, G., 2005. Cultural differences in urban recreation
737 patterns: an examination of park usage and activity participation across six population
738 subgroups. Managing Leisure 10, 1, 19 – 38.

739

740 Schrijnen, P.M., 2000. Infrastructure networks and red-green patterns in city regions.
741 Landscape and Urban Planning 48, 191–204.

742

743 Scott, D., 1991. The greening of Warrington. Landscape Design, February, 24-25.

744

745 Smith, T., Nelischer, M., Perkins, N., 1997. Quality of an urban community: a
746 framework for understanding the relationship between quality and physical form.
747 Landscape and Urban Planning 39, 229-241.

748

749 Snape, R., Binks, P., 2008. Re-thinking sport: physical activity and healthy living in
750 British South Asian Muslim communities. Managing Leisure 13, 1, 23- 35.
751
752 Southwood, T.R.E., Henderson, P.A., (Eds.) 2000. Ecological methods. 3rd Ed.
753 Blackwell Science, London.
754
755 Stewart, W.P., Liebert, D., Larkin, K.W., 2004. Community identities as visions for
756 landscape change. Landscape and Urban Planning 69; 315–334.
757
758 Todorovic, J., Wellington, S., 2000. Living in urban England: attitudes and
759 aspirations. UK Government Department for the Environment, Transport and the
760 Regions; London.
761
762 Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kazmierczak, A., Niemelä, J.,
763 James, P., 2007. Promoting ecosystem and human health in urban areas using green
764 infrastructure: a literature review. Landscape and Urban Planning 81, 167–178.
765
766 Ulrich, R.S., 1981. Natural versus urban scenes: some psychological effects.
767 Environment and Behaviour 13, 5, 523–556.
768
769 Ulrich, R.S., 1993. Biophilia, biophobia and natural landscapes. In Kellert, S.R.,
770 Wilson, E.O. (Eds.), The Biophilia Hypothesis. Island Press / Shearwater Books,
771 Washington, DC, pp. 74-137.
772

773 Vuorisalo, T., Lahtinen, R., Laaksonen, H., 2001. Urban biodiversity in local
774 newspapers: a historical perspective. Biodiversity and Conservation 10, 10, 1739-
775 1756.
776
777 Walmsley, A., 1995. Greenways and the making of urban form. Landscape and Urban
778 Planning 33, 81-127.
779
780 Walmsley, A., 2006. Greenways: multiplying and diversifying in the 21st century.
781 Landscape and Urban Planning 76, 252–290.
782
783 Ward-Thompson, C., 2005. "It gets you away from everyday life": local woodlands
784 and community use – what makes a difference? Landscape Research 30, 1, 109-146.
785
786 Weber, T., Sloan, A., Wolf, J., 2005. Maryland's Green Infrastructure Assessment:
787 development of a comprehensive approach to land conservation. Landscape and
788 Urban Planning 77, 94-110.
789