



VISITOR ACCESS PATTERNS ON ASHDOWN FOREST

FOR MID SUSSEX AND WEALDEN DISTRICT COUNCILS

September 2009





Visitor Access Patterns on Ashdown Forest

Recreational use and nature conservation

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Abbreviations

AONB	Area of Outstanding Natural Beauty
BTO	British Trust for Ornithology
CRoW	Countryside and Rights of Way Act 2000
DCLG	Department for Communities and Local Government
GIS	Geographic Information System
GOSE	Government Office South East
H	'High-usage' car park
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
L	'Low-usage' car park
M	'Medium-usage' car park
MSDC	Mid Sussex District Council
ONS	Office for National Statistics
OS	Ordnance Survey
p	p-value (measure of probability of significant correlation)
PA	Pedestrian access
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCARRABS	Statutory Conservation Agency/RSPB Annual Breeding Bird Scheme
SD	Standard Deviation (from mean)
SE	Standard Error (measure of sampling variability)
SEERA	South East England Regional Assembly
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WDC	Wealden District Council

Executive Summary

E1.1 Background

In February 2008 Mid Sussex District Council published a consultation on the district's emerging Core Strategy, a Local Development Document which will form the central element of the district's Local Development Framework. In accordance with the Conservation (Natural Habitats &c) (Amendment) Regulations 2007, the Council prepared a Habitats Regulations Assessment (HRA) Screening Statement (Tesserae Environmental Consultants Ltd, 2008) to accompany the Core Strategy consultation.

The purpose of the HRA Screening Statement was to identify any likely significant effects arising from the Core Strategy, with the potential to cause adverse effects on the ecological integrity of the Ashdown Forest Special Area of Conservation (SAC) or Special Protection Area (SPA). A key finding of the Screening Statement was that the targeted levels of development within the district, and consequent increase in population, would lead to increased levels of recreational activity at the district's open spaces, including Ashdown Forest. The Screening Statement recommended that this issue should be examined in more detail during an appropriate assessment of the Core Strategy. It also noted that insufficient data were readily available to inform an investigation into the significance of this effect on the conservation objectives of the SPA.

This report describes the methods and findings of a detailed recreational visitor survey carried out at Ashdown Forest during September 2008. The data, analysis and discussion contained in the report will be used to inform future stages of assessment of the Mid Sussex Core Strategy, which will be addressed in a separate document. The findings will also be used by Wealden District Council, which jointly funded the work.

E1.2 Methodology

In order to provide the necessary understanding of visitor access patterns required to inform strategic access management, the study has examined the range of access points onto the Forest to determine the types of visitors coming to the Forest, how frequently and why they visit, the routes they take while there, and the distance they travelled to reach the Forest.

A variety of methods have been used, including:

- ▶ Face-to-face interviews (questionnaires) with visitors leaving the Forest;
- ▶ Counts of the number of people and dogs arriving at, or leaving access points on the Forest;
- ▶ Statistical analysis of the above two datasets;
- ▶ Analysis of postcode data on the origin of visitors;

- ▶ GIS mapping of the origin of visitors and the routes they took on the Forest; and
- ▶ GIS mapping of known bird territories and habitats.

At the request of Natural England, and to offer some comparability with similar studies elsewhere, the study was designed broadly to follow the methods used during surveys of the Dorset Heathlands (Clarke *et al.*, 2006) and the Thames Basin Heaths (Liley *et al.*, 2006).

E1.3 Findings

The findings confirm that Ashdown Forest is a well used resource with a local (as opposed to tourist) catchment area of up to 13km. From the survey, annual visits to the Forest are estimated at around **1.35 million**, with the majority of people (60.0%) visiting for the primary purpose of dog-walking. However, prevailing weather conditions during the survey are expected to have led to an underestimate of total visitor numbers. A brief comparison is made with automated vehicle counter data from one car park (Broadstone), which suggests that the actual number of visitors using access points with car parks that remain open year round could be up to 2.4 times higher than the data collected during this study indicate, although this may not be the case across all car parks. A revised estimate of total visitors taking into account the difference recorded by automated vehicle counters suggests an annual figure of **up to 2.91 million**, however, this does not take into account seasonal closures or any visitors who may have arrived at a car park but not visited the Forest.

Extensive informative data has been gathered which will help to inform the provision of alternative recreational sites, and refine visitor access management and habitat management at Ashdown. This includes:

- ▶ The **total number of people** recorded leaving the 20 sample access points throughout the duration of the survey was 1,499. This compared to 1,758 people recorded as arriving at the access points;
- ▶ An estimated 169,634 people **lived within 15km** of Ashdown Forest in 2007;
- ▶ **Group size** ranged from a single person to a party of 14. The most frequently recorded group size was one, with 55.9%, followed by groups of two with 33.2%, meaning that 89.1% of all visitors to the Forest observed during the survey travelled in groups of two or less;
- ▶ In total, 944 of the people present in interviewed groups were **adults** (88.3%), and 125 were **children** (11.9%);
- ▶ In addition to the number of people recorded, **953 dogs** were recorded leaving the site, while 1,056 dogs were recorded arriving. This shows that, across all people arriving and departing, there is an average of 0.62 dogs accompanying every person;
- ▶ The majority of questionnaire respondents are **regular users** of the Forest, with 73.3% visiting once a day or once a week. A further 8.5% visit at least monthly;
- ▶ Of those visiting the Forest on a daily basis, 90.3% stated their **primary reason** for visiting was to walk the dog. A further 80.4% of those visiting on a weekly basis, and 59.3% of those visiting monthly, did so primarily to walk the dog;

- ▶ The majority of people who visited the Forest during the survey period came at the **weekend** (58.7%);
- ▶ Also, the majority of people interviewed use the Forest **all year round**; 81.3% of people stated that there was no difference in their usage patterns over the year, while 12.5% use the Forest more in the summer than at any other time of the year;
- ▶ Just under two thirds of the people interviewed arrived at the site **between 10am and 3pm**. Only 13.0% of visitors arrived before 9am while 27.6% of people arrived between 5 and 7pm;
- ▶ By far the most common **reason for visiting** was to walk the dog (60.0%) followed by walking (30.0%). Horse riding, bicycling and running were each given as the reason for visiting by 1.0% of the people interviewed;
- ▶ Of the groups interviewed, 87.0% travelled by **motorised transport** to reach their access point, while 11.2% travelled by foot and 2.5% travelled by non-motorised transport;
- ▶ Overall, cars travel around 11km to the access points, while people on foot travel an average of 3.3 km. Some 40% of cars **travelled less than 5km**, while nearly 85% travelled 10km or less, indicating significant usage by the local population. Of those travelling on foot, almost 75% travelled less than 5km and 45% travelled less than 1km to the access point;
- ▶ The 2.8% of respondents (or 16 groups) who travelled more than 7.5km on foot to reach the Forest are thought to have been passing through on a long distance route, such as the High Weald Landscape Trail or Vanguard Way. This includes one group of six recorded as originating from 10km away;
- ▶ Although only around 10% of visitors from Mid Sussex travel less than 3km to reach the Forest (perhaps because the Forest falls mostly outside of district boundaries), almost 70% travel less than 7.5km, and more than 90% travel less than 10km to reach Ashdown. Some 45% of Wealden residents travel less than 2km to reach the Forest while 73% travel less than 3km and 91% travel less than 4km;
- ▶ The average dog-walker will travel around 2.5km while on the Forest, but they will only venture a mean 968.8m from their access point. Conversely, walkers will travel an average 2.8km and **penetrate** 1,034.0m onto the Forest;
- ▶ Three quarters of dog-walkers accessing the Forest travelled '**mostly on the tracks**' during their activities. Only 9.9% spend most of their time off the main tracks;
- ▶ Meanwhile, 79.3% of people allowed their **dog off the lead** for the majority of their walk. Only 5.4% kept their dog on the lead for all of the walk;
- ▶ Of the 639 people who answered the questionnaire, 98.9% expressed an opinion about **paying for car parking**. Of those that answered, 56.7% said they would pay a parking charge, 38.3% said they did not want to pay park and only 4.8% did not know;
- ▶ Almost two-thirds (399 groups or 62.4% of the full sample) of respondents use alternative sites for the same primary purpose, with the remaining 37.6% of groups either not using alternative sites or not willing to answer this section. The responses

indicate that 20.6% use alternative sites on at least a daily basis, 30.3% on a weekly basis, a further 23.1% on a monthly basis, and 25.8% use them only sporadically;

- ▶ When asked about which **other recreational sites** they use, 18.4% of respondents named an alternative site within the Forest (ie, a different access point to the one at which they were interviewed), while 28.3% visit land with a similar open aspect. In addition, 20.9% visit alternative woodland or forest such as Friston Forest, Crowborough Woods or Gravetye Woods;
- ▶ The data also show that 39.4% of dog-walkers visit alternative **open land**, as compared to 24.3% of other users, and 2.3% of dog-walkers visit alternative **heathland** sites in comparison with 0.3% of other users. However, fewer dog-walkers (16.7%) visit alternative **woodland** sites than non-dog-walkers (22.4%); and
- ▶ The most common reason for visiting Ashdown Forest was the '**openness**', stated by 28.0% of groups. A further 20.5% stated that the views were an important factor in choosing to visit Ashdown, followed by the 'natural beauty' (10.3%), 'ruralness' (6.8%), 'birds/wildlife' (5.3%) and water features (0.6%).

In addition, a predictive model is presented to assist in determining strategic spatial planning priorities. For example, it is shown that a theoretical housing development of 500 homes 300m from the Forest could generate an estimated **additional 257,871 visits** per year.

E1.4 Conclusions

This report sets out the findings of a study into visitor access patterns at the Ashdown Forest SPA. The survey was carried out during summer and autumn 2008 and generated data resulting from 639 completed interviews. The total number of visitors to the Forest originating from within Mid Sussex (based on postcode and postcode-stem data only) is calculated as 145 (9.7% of the total recorded), and 587 (39.2%) from within Wealden.

E1.5 Acknowledgements

This project was commissioned by Mid Sussex District Council and Wealden District Council on behalf of a partnership of stakeholders including the Conservators of Ashdown Forest, Natural England, the RSPB and the High Weald AONB Unit. We are grateful to Alma Howell, the Project Officer, for her support.

The contract specification was defined in association with Alma Howell (Mid Sussex District Council), Marina Brigginsshaw (Wealden District Council), Cath Laing and Jayne Field (Natural England), Hew Prendergast and Chris Marrable (Conservators of Ashdown Forest), Harriet Denison and Carrie Temple (RSPB), John Day (RSPB / Footprint Ecology) and Neil Ravenscroft (University of Brighton).

We are also grateful to a number of data providers, including: Niels Cadee (RSPB) and the British Trust for Ornithology for bird territory data; Andrew Marsh and Ed Sheath (Mid Sussex DC) for GIS and planning data; Henri Brocklebank and Penny Green (Sussex Wildlife Trust) for habitat data; Simon Aguss (High Weald AONB Unit); and Tracy Buxton (Conservators of Ashdown Forest) for traffic count data.

1 Introduction

1.1 Background

In February 2008 Mid Sussex District Council (MSDC) published a consultation on the district's emerging Core Strategy, a Local Development Document which will form the central element of the district's Local Development Framework. In accordance with the Conservation (Natural Habitats &c) (Amendment) Regulations 2007 (hereafter 'the Habitats Regulations'), the Council prepared a Habitats Regulations Assessment (HRA) Screening Statement (Tesserae Environmental Consultants Ltd, 2008) to accompany the Core Strategy consultation.

The purpose of the HRA Screening Statement was to identify any likely significant effects arising from the Core Strategy, with the potential to cause adverse effects on the ecological integrity of the Ashdown Forest Special Area of Conservation (SACⁱ) or Special Protection Area (SPAⁱⁱ). A key finding of the Screening Statement was that the targeted levels of development within the district, and consequent increase in population, would lead to increased levels of recreational activity at the district's open spaces, including Ashdown Forest. The Screening Statement recommended that this issue should be examined in more detail during an appropriate assessment of the Core Strategy. It also noted that insufficient data were readily available to inform an investigation into the significance of this effect on the conservation objectives of the SPA.

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1.2 The Ashdown Forest

Ashdown Forest is located within the East Sussex district of Wealden, and is immediately adjacent to Mid Sussex district. Nearby towns include Tunbridge Wells to the north-east, Crowborough to the east, Uckfield to the south, Haywards Heath and Burgess Hill to the south-west, and East Grinstead to the north-west. Smaller settlements close to the Forest include Maresfield to the south, Nutley to the south-west, Forest Row to the north-west and Hartfield to the north-east.

The homepage of the Conservators of Ashdown Forest (2007) website describes the Forest as follows:

ⁱ As designated under European Union Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('the Habitats Directive').

ⁱⁱ As designated under European Union Directive 79/409/EEC on the conservation of wild birds ('the Birds Directive').

Originally a deer hunting Forest in Norman times, Ashdown Forest is now the largest free public access space in the South East. It is a great place for walking and enjoying spectacular views over the Sussex countryside and is known the world over as the 'home' of Winnie-the-Pooh.

The Forest is at the heart of the High Weald Area of Outstanding Natural Beauty and has national and international protection because of its wildlife. Nearly two thirds of its 6,500 acres (2,500 hectares) are heathland, amounting to 2.5% of the UK's extent of this rare habitat.

The Forest was designated as a Site of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act (1981) in 1986, in respect of its status as one of the largest single continuous blocks of heath, semi-natural woodland and valley bog in south-east England. It supports several uncommon plants, a rich invertebrate fauna, and important populations of heath and woodland birds.

The Forest was afforded further legal protection in 1996 when designated as an SPA, and again in 2001 when designated as an SAC. Notwithstanding the importance of the Forest for a wide variety of habitats and species, and as a recreational, agricultural, silvicultural and military resource, the focus of this report is on the SPA designation rather than SSSI or SAC. This is because it is primarily the SPA features that have been identified as at risk of likely significant effects from surrounding development, however, the data presented could equally be used in assessments relating to other species and habitats.

The qualifying features of the SPA (that is, the reasons for its designation) are as follows:

- ▶ Twenty pairs of Dartford warbler *Sylvia undata*, representing around 1.0% of the total breeding population of Great Britain in 1991-92; and
- ▶ Thirty-five pairs of nightjar *Caprimulgus europaeus*, representing around 1.3% of the total breeding population of Great Britain in 1994.

Both are ground-nesting, heathland specialist birds.

The Joint Nature Conservation Committee (JNCC, 2001) describes the Forest as:

*'...located in the High Weald of East Sussex in south-east England, where valley mires, heath and damp woodland have developed on soils derived from Hastings Sands (Lower Cretaceous). Once a royal hunting Forest, reduced grazing has resulted in the accelerated development of woodland and encroachment of bracken *Pteridium aquilinum* over former heath. Nevertheless, some fine examples of heathland habitats remain, with humid or wet heath predominating, dominated by heather *Calluna vulgaris*, bell heather *Erica cinerea* and cross-leaved heath *E. tetralix* in the dampest conditions.*

*Where drier heaths occur they are dominated by heather in association with gorse *Ulex europaeus* and dwarf gorse *U. minor*. Streamsides and mires add further variety, with Sphagnum mosses, cottongrass *Eriophorum* sp., bog asphodel *Narthecium ossifragum* and round-leaved sundew *Drosera rotundifolia* all characteristic plants. The woodlands*

are also varied, with birch *Betula* sp. typically establishing first over heath, followed by oak *Quercus robur*, willow *Salix* sp. and pine *Pinus* sp. in places, eventually forming dense and shaded areas with sparse ground flora. Breeding birds of heath, scrub and woodland are associated with the varied mosaic of their respective habitats, distributed over the higher slopes and valleys of the High Weald.

Together with the nearby Wealden Heaths SPA and Thames Basin Heath SPA, Ashdown Forest forms part of a complex of heathlands in southern England that support breeding bird populations of European importance.

1.3 Comparison between National and Local Bird Trend Data

According to *Birds of Sussex* (James [ed.], 1996), Sussex typically holds 20% of the country's nightjars. The Dartford warbler re-colonised Ashdown Forest in 1989 (one pair) and has since expanded, with twelve pairs recorded by 1993 and 26 by 1994. Notwithstanding visitor numbers, species' populations will fluctuate in any event, for example the very cold spring of 2005 is thought to have led to a sharp drop in the numbers of Dartford warbler.

In order to help establish the baseline position, ie whether the current level of visitor activity is negatively affecting bird populations at Ashdown, it is useful to compare local bird population trend data with the national picture. **Table 1.1** lists this data for Dartford warbler and nightjar (Pers. comm., 2008a and 2009).

Table 1.1: National and local bird population trends (Source: RSPB, Ashdown Conservators)

Year	Dartford warbler (pairs)				Nightjar (pairs)			
	Ashdown Forest	+/- (%)*	National	+/- (%)*	Ashdown Forest	+/- (%)*	National	+/- (%)*
1992	-	-	-	-	-	-	3,400 ⁽³⁾	0.0
1993	12	0.0	-	-	-	-	-	-
1994	26	+116.7	1,889 ⁽¹⁾	0.0	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	53	+341.7	-	-	52	0.0	-	-
1998	67	+458.3	-	-	-	-	-	-
1999	60	+400.0	-	-	64	+23.1	-	-
2000	77	+541.7	-	-	69	+32.7	-	-
2001	85	+608.3	-	-	69	+32.7	-	-
2002	62	+416.7	-	-	-	-	-	-
2003	37	+208.3	-	-	-	-	-	-
2004	42	+250.0	-	-	67	+28.8	4,606 ⁽⁴⁾	+35.5
2005	36	+200.0	-	-	54	+3.8	-	-
2006	-	-	3,214 ⁽²⁾	+70.1	-	-	-	-

1. Gibbons and Wotton (1996)
 2. Wotton *et al.* (in press)
 3. Morris *et al.* (1994)
 4. Conway *et al.* (2007)
- * Percentage change in comparison to first year of data listed in this table.

The data shows that, although starting from a very low base, the Dartford warbler is faring better within Ashdown Forest than nationally, with the population 200% larger in 2005 than it was in 1993. During the period 1994 – 2006 the national population grew by 70% in comparison. Turning to the nightjar, the Ashdown Forest population grew by almost 29% from 1997 – 2004, while the national population increased 35% between 1992 and 2004.

For both species, however, there has been a decline in the 2005 population since the highs of 2001; a decline of -57.6% for Dartford warbler and -21.7% for nightjar based on the 2001 figures. The reasons for this remain unclear but could relate to weather conditions, survey coverage, or increasing visitor numbers. But both species' populations remain above the levels present at the time the European designation was cited.ⁱⁱⁱ

1.4 The Relationship between Open Access Land and Nature Conservation

In a recent review for *Ibis*, the journal of the British Ornithologist's Union, Bathe (2007) gave an entertaining account of the mass movement toward open access to the countryside. Direct action and legislative proposals spanning over a century – as well as the length and breadth of the country – began with the unsuccessful Access to Mountains (Scotland) Bill in 1884, reached the midpoint highlight that was the National Parks and Access to Countryside Act (1949), before culminating in the Countryside and Rights of Way (CRoW) Act (2000).

The combined concerns of the need for fresh air and exercise, a demand for countryside recreation, and entrenched class divides, coupled with an '*awareness that intensive agriculture was placing a major burden on taxpayers in the form of vast food surpluses, [and] consequential losses of traditional landscapes and wildlife*' (Bathe, 2007: 4) proved successful. But not without extensive debate on passage through the Houses of Parliament.

The CRoW Act grants a right of access on foot for the purpose of open air recreation, to specified categories of land, subject to a wide range of general restrictions, such as ensuring dogs are kept on short fixed leads during the wild bird breeding season, and not lighting fires, intentionally or recklessly injuring animals, or leaving gates open. In so doing, there is recognition of the potential tension between nature conservation and right to roam. The land qualifying for access was mapped between 2001 and 2004 by the Countryside Agency, and this exercise revealed some interesting overlaps.

ⁱⁱⁱ Woodlark is also present in Ashdown Forest; the population has grown from one territory recorded during the 1997 national survey, to 42 territories in the 2006 survey. Forty-two is more than 1% of the UK population, which qualifies for European importance.

Firstly, 39% of all access land is common land. Second, 55% of access land is also designated as SSSI, an area of approximately 1 million hectares (Bathe, 2007). This further illustrates the importance of resolving any potential tension between recreation and nature conservation. The arrival of the CROW Act established both the impetus and, indirectly, the funding mechanism to investigate this relationship in more detail, by highlighting the need for decision-making based on the best scientific data and technical knowhow available, in order to develop appropriate access management regimes. Such regimes need to be tailored to the needs of both wildlife and of people, and take account of local circumstances, such as the proximity and density of developed areas.

1.5 Development in Mid Sussex and Wealden

Future levels of development in Mid Sussex and Wealden will be driven by the provisions of the South East Plan (Regional Spatial Strategy (RSS), GOSE, 2009). The RSS identifies two sub-regions which may in time prove relevant to increasing visitor numbers at Ashdown Forest; the Gatwick Sub-Region (with a focus on growth and regeneration) and, less so due to its greater distance from Ashdown Forest, the London Fringe (with a focus on growth). Additionally, associated with these is the Gatwick – Crawley Diamond for [economic] Investment and Growth. The rest of East Sussex, and the rest of West Sussex are areas outside of allocated sub-regions or growth areas that may also have an impact on visitor numbers to the Forest.

The Gatwick Sub-Region will be expected to provide 36,500 new homes in the period 2006-26, and 17,400 new jobs in the period 2006-16. The London Fringe Sub-Region, meanwhile, will be expected to contribute 48,620 new homes in the period 2006-26, and 39,500 new jobs in the period 2006-16. There will be a further 6,600 new homes provided in each of the rest of East and West Sussex.

Specific housing allocation numbers from the RSS are:

- ▶ **Mid Sussex: 17,100 new homes**, 16,800 of which will be focused on the Gatwick Sub-Region; and
- ▶ **Wealden: 11,000 new homes**, 4,000 of which will be focused in the rest of East Sussex in Wealden.

1.6 Why Study Human Disturbance Effects?

So what could this level of increased development mean for Ashdown Forest? As Murison *et al.* (2007) note, animals often react to human disturbance as a form of predation risk (see also Frid & Dill, 2002). Such a response can include elevated heart rate, heightened defensive behaviour, including evasive measures with associated energy expenditure, and the avoidance of high risk areas (Murison *et al.* (2007), Liley & Sutherland (2007)). It is possible, therefore, that high levels of human activity in important nature conservation areas changes the behaviour of animals to such a degree that conservation priorities become compromised. This may be elicited through, for example, reduced breeding success, increased predation or exposure of nests, eggs or young to trampling and the elements (Liley & Sutherland, 2007).

Meanwhile, it has been observed that the removal of human disturbance effects could result in an increase of between 13% and 48% in the breeding population of woodlark *Lullula arborea* over 16 heathland sites (Mallord (2005), quoted in Underhill-Day & Liley (2007)).

Liley and Clarke (2003), following field studies into the population density of nightjar on 36 patches of heathland in Dorset, demonstrated that patches surrounded by higher levels of development supported smaller populations of nightjar. The types of effects associated with urbanisation that they identified as relevant in this respect included human disturbance, light pollution, predation from natural predators and domestic pets (as well as corvids, foxes *Vulpes vulpes*, and hedgehogs *Erinaceus europaeus*), and habitat change. In the face of these challenges, conservation officers and managers of open access land might consider a number of responses to balance the effects of human disturbance and urbanisation (see also **Chapter Four**) with the need for access to recreation.

These include both site-level responses, such as restricted access at certain times of year or changes to planting regimes, as well as strategic alternatives, such as the provision of substitute recreational facilities in less sensitive areas (Underhill-Day & Liley, 2007). Langston *et al.* (2007) suggest that responsible access '*... necessitates the provision of information for visitors to heathland to help them understand their... responsibilities and... change their behaviour*'.

Ashdown Forest is qualitatively different to the Dorset heathlands, and indeed the Thames Basin heaths which received much attention during the Examination in Public of the South East Plan. The Thames and Dorset sites are made up of a series of heathland fragments disconnected from one another, whereas Ashdown Forest is a single large composite site where the patches of heathland are interconnected by semi-natural grassland and woodland. Furthermore, Ashdown is a well-known destination not unlike the New Forest, albeit smaller in scale, and as result may prove to be under considerable visitor pressure.

An analysis of visitor access patterns, therefore, is an essential first stage in developing an understanding of how to react to the challenges presented by increasing levels of human disturbance that might be associated with increased development. As Underhill-Day and Liley (2007) put it, the range of site-level and strategic management responses available need to be considered in light of '*a range of questions on where heathland users come from, why they come to the heaths, where they go and what they do once there.*'

1.7 Literature Review

Several studies of the interrelationship between recreational access and heathland biodiversity have been undertaken in recent years (see for example Clarke *et al.* (2006), Liley (1999), Liley & Clarke (2002, 2003), Liley *et al.* (2006), Murison (2002) and Murison *et al.* (2007)). The focus of most of these studies has been on the Dorset Heathlands, and also Thames Basin Heaths. This section will introduce some of the pertinent issues, which may prove relevant to a study of Ashdown Forest.

1.7.1 *Mechanisms and measures of disturbance*

In a study into the relationship between habitat type and disturbance effects on the breeding Dartford warbler, Murison *et al.* (2007) noted the following as important measures of disturbance. First, they noted that indirect disturbance was associated with factors such as the distance from the centre of the heathland patch (or nest) to the nearest road, path, building or car park. Second, the proximity of a nest territory to the nearest access point showed a strong, direct negative relationship with the timing of a first brood. Third, disturbance appeared to be associated with increased stress levels, with birds exhibiting an extended period of agitation while searching for cover, leading to increased energy expenditure.

They suggest that the mechanisms by which disturbance affects the Dartford warbler's breeding success are associated with its particular susceptibility to disturbance during nest-building activities, with birds often abandoning their work and materials. The effects of this are threefold. The timing of the first brood was delayed for long enough (up to six weeks) to prevent multiple broods in one season. Also, the fledgling success of a first brood delayed until June was limited by the decreased availability of invertebrate prey. And similarly, that continued disturbance events reduced the foraging effectiveness of the birds, and their ability to feed their young, by keeping the adults away from the nest for longer than normal.

Analysing the results of their study, Murison *et al.* (2007) found that breeding pairs with territories in areas experiencing as many as 13 to 16 disturbance events each hour of every day, delayed breeding for sufficiently long enough to prevent multiple broods in one season. Importantly, they also found a significant correlation between breeding success and habitat type (see **section 1.7.3**, below).

1.7.2 *Vulnerabilities of ground nesting birds*

As already mentioned, Liley and Clarke (2003) found that nightjar populations appeared particularly vulnerable to the effects of urbanisation, including human disturbance, light pollution, and predation by natural predators, pets and urban scavengers. In a study investigating the relationship between walkers with dogs and the success of breeding nightjar, Langston *et al.* (2007) observed that the flushing of birds from the nest by a disturbance event during daylight hours led to predation by diurnal predators, particularly of eggs. Moreover, birds tend to flush more readily in response to dogs than to humans, and take longer to return to the nest.

Furthermore, Langston *et al.* (2007) noted that disturbance effects on nightjar were more marked when breeding conditions were less favourable due to incidental factors such as weather conditions. Birds flushing the nest as a result of disturbance events during harsh or wet weather tended to bear smaller, less successful broods. Overall, they found a significant relationship between nest failure and disturbance, with failure being more likely in nests with higher total footpath length within 50, 100 and 500m of the nest clearing.

1.7.3 *Habitat type*

Heathland habitat is dominated by heather *Calluna vulgaris*, but often also supports species of gorse, including European gorse *Ulex europaeus*, western gorse *U. gallii* and dwarf gorse *U. minor*. Murison *et al.* (2007) found a significant correlation between the reproductive success

of Dartford warbler and the proportion of different gorse types present in the heathland patch.

Dwarf gorse is not associated with the birds' ecology, but it is found to nest in areas with considerable coverage of European gorse and, to a lesser extent, in areas with Western gorse. This is because European gorse offers shelter from harsh weather conditions and predators, as well as bountiful invertebrate prey. Western gorse is shorter and denser, offering limited protection from adverse weather and possibly restricting movement (Catchpole & Phillips (1992), quoted in Murison *et al.* (2007)).

The incidence of gorse species is important because Murison *et al.*'s (2007) statistical analyses demonstrates a strong positive relationship with European gorse, where heathland patches containing more of this type produced more successful broods. While the significance of disturbance events in delaying breeding among Dartford warbler pairs nesting in heather-dominated territories was high, often leading to reduced breeding success (see **section 1.7.1**, above), the correlation was weaker in territories dominated by Western gorse. Importantly, however, there was no discernible relationship between breeding success and disturbance events in European gorse dominated territories.

During their surveys, dogs were observed ranging as far as 45m into heather dominated areas, but never strayed from the path in areas with vegetation dominated by gorse. This could provide a useful tool to heathland managers, whereby the erudite positioning of gorse varieties, particularly alongside paths and bridleways, may help to reduce the incidence of disturbance. This may, of course, conflict with other conservation priorities especially in areas where the heathland habitat itself is of international importance, such as Ashdown Forest.

1.7.4 *Development density*

For Liley and Clarke (2003) the significance of the above factors was not subject to any noticeable edge effects. In other words, the effect on nightjar population density did not decrease with the size of heathland patch surveyed. In fact the relationship appeared to be the opposite way around, despite the logical assumption that a larger heathland patch would offer increased shelter from such effects by putting a greater distance between the cause of the effect and the receptor.

However, they did observe a relationship between the loss of foraging habitat and population density. Nightjar tends to avoid heathland as a foraging habitat, preferring nearby woodland instead. Their analyses of the density of development and woodland within 500m of a heathland patch revealed that both factors had a significant relationship with nightjar population density, whereby a greater density of development coincided with smaller nightjar populations, even though the two variables were not in themselves related. Conversely, a lesser density of woodland also coincided with smaller nightjar populations, although again the two variables were not in themselves related.

1.8 Purpose and Outcomes of this Study

The purpose and primary objective of the recreational user survey is to provide coherent and appropriate data on visitor access patterns within Ashdown Forest, with a focus on those originating from within Mid Sussex and Wealden districts.

Based on the findings of the literature review, the study will aim to gather a variety of data, including:

- ▶ The number of visitors from Mid Sussex and Wealden visiting the Forest, and that number as a proportion of the total number;
- ▶ Visiting patterns, ie, most common times of the day or week, and frequency of visit;
- ▶ Patterns of activity, including the reasons for visiting the Forest and the distance and routes travelled within the Forest;
- ▶ Whether or not the visitor has a dog with them, and whether it is on or off the lead; and
- ▶ Distance and mode travelled to the Forest including origin, preferably as post code or post code stem.

The hypothesis of the study is that the number of Mid Sussex and Wealden residents travelling to the Forest, as a proportion of the total number, will decrease as the distance of their origin from the Forest increases. If held to be true, the quality of data gathered will help to provide a means of assessing the impact of new development, and guide the location of new development and/or the provision of new accessible natural greenspace.

1.9 Structure of this Document

The remaining sections of this report will contain the following information:

- ▶ **Chapter Two:** a description of the target data and methods used to uncover them;
- ▶ **Chapter Three:** a presentation of the results of the survey and findings of statistical analyses;
- ▶ **Chapter Four:** a discussion of the findings and implications of the study; and
- ▶ **Chapter Five:** conclusions and suggestions for further research.

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2 Methods

2.1 Introduction

In order to provide the necessary understanding of visitor access patterns required to inform strategic access management, the study has examined the range of access points onto the Forest to determine the types of visitors coming to the Forest, how frequently and why they visit, the routes they take while there, and the distance they travelled to reach the Forest.

A variety of methods have been used, including:

- ▶ Face-to-face interviews (questionnaires) with visitors leaving the Forest;
- ▶ Counts of the number of people and dogs arriving at, or departing from access points to the Forest. Observations were recorded both for people who exited the vehicle they arrived in and visited the Forest, and for those who remained in their vehicle and did not visit the Forest;
- ▶ Statistical analysis of the above two datasets;
- ▶ Analysis of postcode data on the origin of visitors;
- ▶ GIS mapping of the origin of visitors and the routes they took on the Forest; and
- ▶ GIS mapping of known bird territories and habitats.

At the request of Natural England, and to offer some comparability with similar studies elsewhere, the study was designed broadly to follow the methods used during surveys of the Dorset Heathlands (Clarke *et al.*, 2006) and the Thames Basin Heaths (Liley *et al.*, 2006).

2.2 Selection of Sample Access Points

There are 48 car parks within the Forest, eight of which (16.7%) close during autumn and winter. The car parks vary both in terms of size and popularity. In addition, there are 18 recognisable footpaths providing direct pedestrian access into the Forest from local residential areas.

In order to achieve a representative sample of access points across the Forest that would provide a statistically valid comparison of the relevant data sets, a meeting was held with the Conservators to utilise their local knowledge and expertise. The spatial variables requiring consideration included:

- ▶ Access points with and without parking provision:
- ▶ Access points with high parking capacity attracting visitors from further afield, and those with more local provision;
- ▶ Informal access points, directly from surrounding residential areas; and

- ▶ The quality of service provision at an access point (information boards, picnic facilities, rest rooms, benches, pond, fishing, signed trails or none of the above).

The exact scope (ie, the number and nature of sites to be sampled) needed to be defined in consultation with Natural England, and a short paper describing the site selection rationale was circulated among the client and project team, as well as the Conservators, Natural England and RSPB. A typology was identified, based on local knowledge, which separated sites of a different nature into the following classes:

- ▶ High usage car parks (H), including on-transit stopping points (total number in Ashdown Forest, $n=10$);
- ▶ Medium usage car parks (M) ($n=17$);
- ▶ Low usage car parks (L), often used mainly by the local population ($n=21$); and
- ▶ Pedestrian access points (PA), which are informal points of entry close to residential areas ($n=18$).

Twenty sampling sites were selected, in accordance with the agreed project specification, with the objective of securing a representative sample both in terms of type and geographic coverage. These are depicted in **Appendix I** to this document. The sites were divided into five geographical sectors, and are named in **Table 2.1**. The number of each access type that was included in the survey, and the proportion of that number as a percentage of the total number of each type, are as follows:

- ▶ High usage car parks (H): **5 (of 10, or 50%), none of which close during winter;**
- ▶ Medium usage car parks (M): **6 (of 17, or 35%), one of which closes for winter;**
- ▶ Low usage car parks (L): **4 (of 21 or 19%), none of which close during winter;** and
- ▶ Pedestrian access points (PA): **5 (of 18 or 28%).**

2.3 Timing of Interviews

Different types of visitor use the Forest in different ways, and potentially at different times of day, week or year. For example, it might reasonably be expected that dog-walkers would visit often, stay for less time, and arrive before and/or after work. Day visitors, on the other hand, are more likely to arrive during the day, take in a variety of activities and penetrate further into the Forest. In addition, visitor patterns vary with the season. Therefore the study was designed to include the following temporal variables:

- ▶ Surveys were carried out early morning and evening, as well as throughout the day;
- ▶ Surveys were carried out during the week and over the weekend;
- ▶ Initially, surveys were planned during August and September, with the option of extending the survey into the winter months of October, November and December or beyond (currently, there are no plans to extend the survey).

Table 2.1: Access points selected for the survey

ID	Type	Name	No. spaces	Facilities		
				Signage/info	Café/picnic	WC
Sector A						
1	PA	Forest Row	n/a	No	No/No	No
2	H	Broadstone	60	Yes	No/Yes	No
3	M	Lintons	15	No	No/Yes	No
4	H	Gill's Lap	40	Yes	No/Yes	No
Sector B						
5	H	King's Standing	60	Yes	No/Yes	No
6	PA	Crowborough / St John's	n/a	No	No/No	No
7	M	Black Hill	50	No	No/Yes	No
8	L	Church Hill	15	No	No/Yes	No
Sector C						
9	L	Pound Gate	15	No	No/Yes	No
10	M	Bushy Willow	10	No	No/Yes	No
11	H	Hollies	40	Yes	No/Yes	No
12	PA	Fairwarp	n/a	No	No/No	No
Sector D						
13	M	Friends	30	Yes	No/Yes	No
14	PA	Nutley	n/a	No	No/No	No
15	H	Millbrook West	30	No	No/Yes	No
16	M	Long	60	No	No/Yes	No
Sector E						
17	L	Goat	10	No	No/Yes	No
18	M	Hindleap	20	Yes	No/Yes	No
19	L	Churlwood	20	No	No/Yes	No
20	PA	Chelwood gate	n/a	n/a	No/No	No

Notes: (Pers. comm. 2008b)

Signage: all car parks have byelaw signs; a 'yes' indicates the ones which have interpretation boards as well.

Café/picnic: there are no cafés but all car parks have some sort of picnic area attached.

No. of spaces: an estimate of the maximum number of cars which could be parked on the hardened surface but excluding the summer 'extension' car parks which are attached to some.

The scope of the survey, ie the number of times each site would be visited, was limited by the available budget. Nonetheless, it was possible to design the survey to give a statistically balanced sample of visitor activity. Each access point was surveyed for a total of eight two-hour periods, with four of these periods occurring on each of a weekday and a weekend day. During both weekdays and weekends, the following survey periods were used:

-
- | | | | |
|---------------|---------------|---------------|---------------|
| ▪ 0700 – 0900 | ▪ 1000 – 1200 | ▪ 1300 – 1500 | ▪ 1700 – 1900 |
|---------------|---------------|---------------|---------------|

The surveys were therefore carried out for a total of 40 eight-hour person days. The original intention was for sampling to straddle both the school holidays and term-time, with an equal number of surveys being undertaken in both. The success of the surveys, however, was expected to be dependent on weather conditions to a certain extent, the idea being to avoid particularly cold or rainy days as they could be a deterrent to potential visitors. Unfortunately the weather during the period around the late summer bank holiday in 2008 was particularly inclement. With the need to avoid the bank holiday in any event, due to its potential ability to distort the survey findings with unusually high numbers of visitors, this meant that the survey started later than planned. Consequently, the survey was carried out during the period 4th – 21st September 2008. Weather conditions were recorded during all survey periods (see **Appendix II**); see also **section 3.3** (limitations). A total of 639 interviews were conducted.

Five teams of two surveyors were despatched on each survey day, one team to each sector. The teams were supplemented by roving supervisors who could offer assistance, support and guidance, as well as fulfilling part of the Health and Safety strategy. The teams were made up of a mixture of professional consultants from UE Associates Ltd, and academics and MSc or PhD students from the University of Brighton.

2.4 The Questionnaire and Face to Face Interviews

During survey periods, people leaving the Forest were asked whether they could spare a few minutes to complete a questionnaire. The questionnaire itself was based initially on those used in previous studies (Clarke *et al.* (2006) and Liley *et al.*, 2006), and was then adapted and added to according to local circumstances. The questionnaire was designed using InDesign CS3 software (version 5.0.3; Adobe, 2007) and circulated for comment among Natural England, the Conservators, RSPB and University of Brighton academics. It was purposefully brief, to maximise participation, but also thorough in its approach.

As with earlier studies, the total number of people within each group was recorded during the interviews, but only one person from each group was actually questioned. The total number of interviews therefore differs from the total number of people arriving at or leaving the Forest. The questionnaire sought to establish the following information:

- ▶ Number of people and children in each group;
- ▶ Frequency of visit to the Forest;
- ▶ Whether or not visits tended to be made at certain times of the day or week;
- ▶ Whether or not visits tended to be made at certain times of the year;
- ▶ Distance or postcode of origin;
- ▶ Type of visitor (local resident, day visitor or overnight visitor);
- ▶ Mode of transport;
- ▶ Entry point (whether or not it was the same as where they were interviewed);
- ▶ Route taken during visit;
- ▶ Main purpose of visit;

- ▶ Whether or not alternative sites (outside of the Forest) were visited for the same purpose, and the names of those sites;
- ▶ Distance travelled to reach alternative sites;
- ▶ Frequency of visits to alternative sites;
- ▶ Mode of transport to alternative sites;
- ▶ Particular qualities or facilities offered by the Forest that alternative sites did not offer (or vice versa);
- ▶ Whether or not the visitor would be prepared to pay a car parking charge^{iv};
- ▶ How many dogs were accompanying the group;
- ▶ Whether or not the dogs were on or off the lead; and
- ▶ Whether or not the party, or members of the party remained on the main tracks for the majority of their visit.

A copy of the questionnaire can be found at **Appendix III**.

2.5 Survey Counts

The number of people and dogs arriving and leaving each access point during each survey period were also recorded. This allows an estimation to be made of the number of visitors originating from within Mid Sussex and Wealden as a proportion of the total numbers recorded during the survey and, by extrapolation, over the course of a year.

2.6 Statistical Analysis

The data generated during the survey has undergone a variety of statistical analyses using SPSS software (version 15.0, SPSS Inc, 2006), the findings of which are presented in **Chapter Three**.

2.7 Analysis of Postcode Data as Visitor Origin

A national postcode database containing the geographic location of a postcode or postcode stem (as a centroid, or central point) was used to determine the origin of interviewed visitors to the Forest (see also Liley & Clarke, 2003). This was undertaken with the aid of an ArcView Geographic Information System (version 9.2, Esri UK, 2006). Each interviewee was asked for their postcode or postcode stem, to determine the distance travelled to reach the access point. The distance travelled was then expressed as the linear distance from the postcode to the access point.

^{iv} **NB:** Advice from Wealden District Council was that the issue of paying for car parking could be particularly contentious with Wealden residents, because the District Council does not levy a charge for using any of the car parks it owns or manages. Survey teams were briefed so as to make it clear to questionnaire respondents that none of the car parks within the Forest are owned or managed by Wealden DC, and that the survey was not part of plans for Wealden DC to commence charging for car parks it owns/manages (none of which are in the Forest).

2.8 Calculating Population Density

Liley *et al.* (2006) noted that the number of houses surrounding a heathland site could be a significant predictor of the number of visitors that might use the site; the approach taken here follows a similar principle, but uses the population density surrounding Ashdown Forest as the predictor. Therefore, once the full database of postcode records had been entered into ArcView, it was necessary to determine the population density of areas within different distances from the Forest.

This was calculated using the Office for National Statistics' Resident Population Estimates (All Persons) Mid 2007 (Super Output Area Middle Layer), to establish the population density in each output area. This was then overlaid with a series of distance bands from the Forest (ie, concentric circles at 200m, 400m 600m, 800m, 1km, 1.5km and so on); see **Appendix IV** for an illustration.

The average population density for each output area was then re-distributed to the urban areas by determining the hectareage of urban areas as a proportion of the whole output area. The population of a given band was then calculated according to the revised population density of each output area coinciding with the distance band, multiplied by the extent of the urban area within that band. This number was summed across all output areas falling within a given distance band to give the total population for that band. The resulting figure provides the number of potential visitors living around the Forest. See also **section 3.2.23**.

2.9 Mapping Routes taken on the Forest

Question nine of the interview asked respondents to trace on an Ordnance Survey map (OS, 1:50,000 scale), the route they had taken on the Forest during their visit. Copies of aerial photography were also used to help people orient themselves and mark the correct route. Each of the completed maps was digitised using ArcView and superimposed on the OS base layer. For each record, therefore, either a circular (for people who entered and exited the Forest at the same access point) or a linear (for people who entered the Forest from a different access to their exit point) route was plotted.

As in Clarke *et al.* (2006) and Liley *et al.* (2006), following digitisation, all routes were summarised using two numerical descriptors; the first represents the total length of the route travelled, while the second describes the '*penetration distance*'; the linear distance from the mid-point of the route to the access point. The relevance of this is described further during the analysis in **Chapter Three**.

2.10 GIS Mapping of Known Bird Territories

SCARRABS data was collected from the BTO (2004) with the help of the RSPB. The data shows the number and location of bird territories for both Dartford warbler and nightjar populations within Ashdown Forest, and is taken from the most recent survey, carried out during 2004. These datasets were also mapped using ArcView, and overlaid with the digitised route plots to examine areas thought to be under the most visitor pressure.

3 Results and Analysis

3.1 Introduction

This chapter describes and analyses the results of the survey. The sub-headings within the analysis section below are set out in approximately the same order as the questionnaire, with one or two amendments to facilitate a logical flow of information.

A variety of analyses have been undertaken, and results are presented as tables, graphs, charts and figures, as appropriate. All errors are standard unless otherwise stated.

3.2 Analysis

3.2.1 *The total number of visitors recorded and variation between access points*

The total number of people recorded leaving the 20 sample access points throughout the duration of the survey was 1,499. This compared to 1,758 people recorded as arriving at the access points, and demonstrates that a number of people (14.7% in this study) either travel a linear route between access points while on the Forest, rather than walking a circular route requiring them to arrive and depart from the same access point, or remain on the Forest for more than two hours.

The minimum number of people arriving or leaving in any two-hour survey period was zero. The maximum number of people leaving during any two-hour period was 45 (excluding horse riders and cyclists), while the maximum number of people arriving was 77 (also excluding horse riders and cyclists). This gives a mean number of 9.47 people leaving the sample access points during a given two-hour period (standard deviation (SD) 8.84), and a mean of 11.09 arriving (SD 12.66).

Of the 1,499 people leaving the Forest, 14 (0.9%) were on horseback and three (0.2%) were cyclists. Conversely, of the 1,758 people arriving at the Forest, 43 (2.4%) were on horseback and five (0.3%) were cyclists. A further 57 people (and five dogs) were recorded as arriving at a car park, but did not exit the car park onto the Forest. These may be on-transit visitors stopping at a car park but not exiting the vehicle to visit the Forest.

In total, 639 interviews were conducted, involving 1,069 people or 71.5% of all people leaving the Forest during the survey period. Unsurprisingly, access point 5 (Kings Standing), a 'high usage' car park, yielded the most questionnaire responses with 137 people present in the groups interviewed at this site. This was closely followed by access point 13 (Friends), a 'medium usage' car park which recorded 131 people present in the interviewed groups. By contrast, the access point yielding the lowest interview completion was point 15 (Millbrook West), a 'high usage' car park, with 15 people involved in questionnaires. Overall, six two-hour survey periods yielded no interviews at all.

The access point with the highest overall number of people leaving was King's Standing, with 194 people leaving, while the lowest was point 9 (Pound Gate), a low usage car park with 31 people recorded leaving in total. **Figure 3.1** illustrates the total number of people interviewed per site.

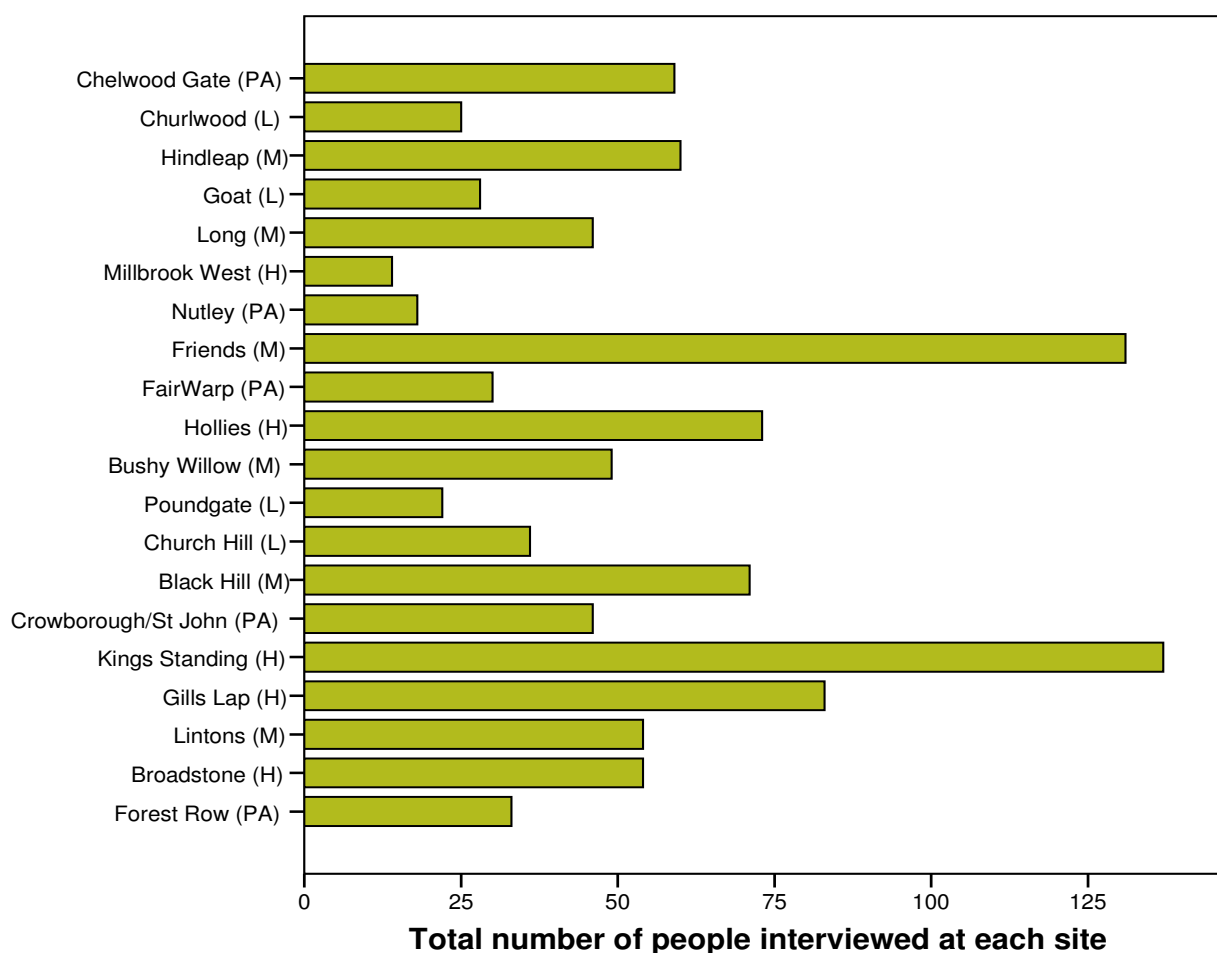


Figure 3.1: Total number of people interviewed per site

3.2.2 Group size

Group size ranged from a single person, to a party of 14 who were visiting from London and the Isle of Wight on a birthday picnic. The most frequently recorded group size was one, with 55.9%, followed by groups of two with 33.2%, meaning that 89.1% of all visitors to the Forest observed during the survey travelled in groups of two or less. **Table 3.1** records the group sizes encountered.

Table 3.1: Group sizes observed during the survey (adults and children)

ID	Sample Access Point	Group Size					
		1	2	3-5	6-9	>10	Tot grps
1	Forest Row PA	22	4	1	0	0	27
2	Broadstone H	12	10	3	1	0	26
3	Lintons M	12	11	1	2	0	26
4	Gills Lap H	33	13	4	2	0	52
5	King's Standing H	29	40	8	0	0	77
6	Crowborough / St John PA	32	7	0	0	0	39
7	Black Hill M	28	18	2	0	0	48
8	Church Hill L	15	7	2	0	0	24
9	Pound Gate L	10	4	1	0	0	15
10	Bushy Willow M	13	9	5	0	0	27
11	Hollies H	21	11	6	1	0	39
12	Fairwarp PA	8	6	3	0	0	17
13	Friends M	23	18	13	1	1	56
14	Nutley PA	9	1	2	0	0	12
15	Millbrook West H	6	4	0	0	0	10
16	Long M	21	8	3	0	0	32
17	Goat L	9	6	2	0	0	17
18	Hindleap M	22	15	2	0	0	39
19	Churlwood L	10	6	1	0	0	17
20	Chelwood Gate PA	22	14	3	0	0	39
No. groups		357	212	62	7	1	639
%		55.9	33.2	9.7	1.1	0.2	100.0

3.2.3 Adults or children

The number of children within each group was recorded as an observation during the interviews. In total, 944 of the people present in interviewed groups were adults (88.3%), and 125 were children (11.9%). The access point with the highest proportion of children recorded was point 14 (Nutley), a pedestrian access, with 38.9%, while the highest number of children recorded was Friends with 23. The site with the highest proportion of adults was Millbrook West at 100%, while the site with the highest number of adults was also King's Standing with 119. **Table 3.2** lists the number of adults and children by survey site.

Table 3.2: Numbers of adults and children in interviewed groups

ID	Sample Access Point	Adults		Children		No People
		No	%	No	%	No
1	Forest Row PA	32	97.0	1	3.0	33
2	Broadstone H	50	92.6	4	7.4	54
3	Lintons M	50	92.6	4	7.4	54
4	Gills Lap H	78	94.0	5	6.0	83
5	King's Standing H	119	86.9	18	13.1	137
6	Crowborough / St John PA	46	100	0	0	46
7	Black Hill M	62	87.3	9	12.7	71
8	Church Hill L	35	94.6	2	5.4	37
9	Pound Gate L	20	95.2	1	4.8	21
10	Bushy Willow M	41	83.7	8	16.3	49
11	Hollies H	59	80.8	14	19.2	73
12	Fairwarp PA	27	90.0	3	10.0	30
13	Friends M	108	82.4	23	17.6	131
14	Nutley PA	10	58.8	7	41.2	17
15	Millbrook West H	15	100.0	0	0.0	15
16	Long M	41	89.1	5	10.9	46
17	Goat L	26	92.9	2	7.1	28
18	Hindleap M	56	93.3	4	6.7	60
19	Churlwood L	21	84.0	4	16.0	25
20	Chelwood Gate PA	48	81.4	11	18.6	59
Total		944		125		1069
%		88.3		11.9		100.0

3.2.4 Number of dogs

In addition to the number of people recorded, 953 dogs were recorded leaving the site, while 1,056 dogs were recorded arriving. This shows that, across all people arriving and departing, there is an average of 0.62 dogs accompanying every person.

Of the groups interviewed, the total numbers of dogs in tow was 731, meaning that there was an average of 0.68 dogs per person. Just over half the groups had one dog with them (see **Table 3.3**), while a further 20.8% had two dogs with them; only 22.2% of groups interviewed were not accompanied by a dog. The number of groups responding to the questionnaire that were accompanied by dogs was 497, giving a mean number of 1.47 dogs per group with a dog.

Table 3.3: Number of dogs recorded and group size

Variable	Number of Dogs per Group						Total
	0	1	2	3	4	5	
No Groups	142	321	133	30	11	2	639
% Groups	22.2	50.2	20.8	4.7	1.7	0.3	100.0
Total No People	331	475	183	46	31	3	1069
Total No Dogs	0	321	266	90	44	10	731

3.2.5 Frequency of visit

Questionnaire respondents were asked to indicate how regularly they visit the Forest; the results are listed in **Table 3.4**. It is clear that the overwhelming majority are regular users of the Forest, with 73.3% visiting once a day or once a week. A further 8.5% visit at least monthly.

Further analysis reveals that dog-walkers are more likely to visit the Forest on a daily basis. Of the proportion of groups interviewed that visit the Forest on a daily basis, 90.3% stated their primary reason for visiting was to walk the dog. A further 80.4% of those visiting on a weekly basis, and 59.3% of those visiting monthly, did so primarily to walk the dog.

Table 3.4: The number and percentage of groups visiting daily, weekly or monthly, showing the high proportion of frequently visiting dog-walkers

Cat	Frequency	Total Groups	% Total Groups	Dog-walk 1ary Purpose*	Dog-walk 1ary Purpose* as % of Groups w/in Freq
1	Daily	279	43.7	252	90.3
2	Weekly	189	29.6	152	80.4
3	Monthly	54	8.5	32	59.3
4	Variable	81	12.7	37	45.7
5	Don't know	36	5.6	14	38.9
Total		639	100.0	487	76.2

* Walking the dog as the stated primary purpose, not simply groups accompanied by a dog.

3.2.6 Weekend vs weekday

Data collection was split evenly between weekdays and the weekend, with each site being surveyed for a total of four two-hour periods during the week, and the same again at the weekend. A Chi-square test indicated that there was a significant difference between usage at weekdays versus weekends ($p > 0.01$). The majority of people interviewed, who visited the Forest during the survey period, came at the weekend (58.7%). Only Millbrook West, much used as a stopping point for passing traffic, recorded a higher usage during the week than at the weekend (53.3%). All other sites recorded a higher number of visitors during the weekend, with sites such as Kings Standing and Friends recording a two- and four-fold increase in visitors at the weekend compared to the weekday (see **Figure 3.2**).

Group size was larger at the weekend than during with week. Analysis of variance indicated that this relationship was significant ($p < 0.00$); see **Figure 3.3**). Of the people interviewed during the week, 70.2% were lone users, while at the weekends this figure dropped to 45.6%. During the week only ten groups were greater or equal to three members (3.8%) while at the weekend, unsurprisingly, this figure increased to 60 accounting for 16% of all those interviewed (see **Table 3.5**).

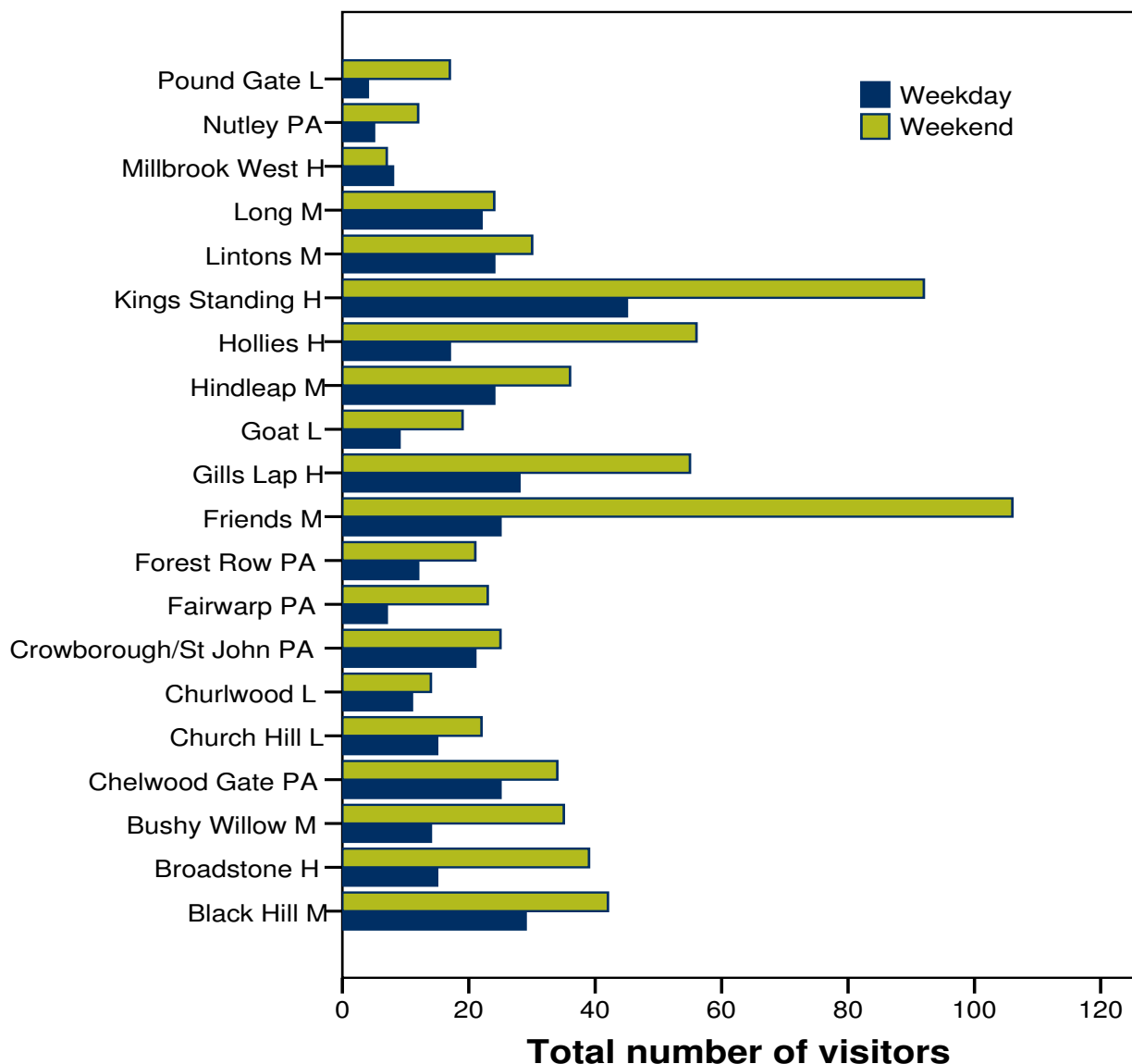


Figure 3.2: Total number of visitors by weekday / weekend

Table 3.5: Group size by weekday / weekend

Cat	Time	Group Size					Total Groups
		1	2	3-5	6-9	>10	
1	Weekday	186	68	9	1	0	264 (41.3%)
2	Weekend	171	144	53	6	1	375 (58.7%)
Total		357	212	62	7	1	639
Percentage		55.9	33.2	9.6	1.1	0.2	100

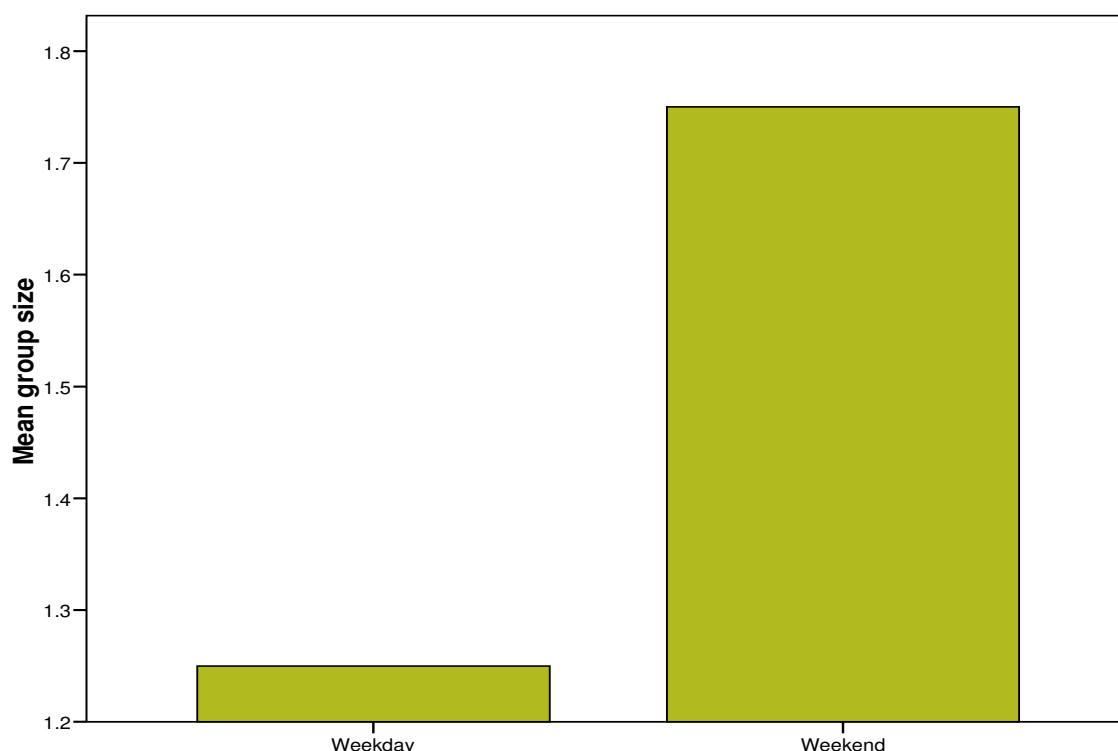


Figure 3.3: Mean number of visitors per group, by weekday/weekend

3.2.7 Time of year

The majority of people interviewed use the Forest all year round; 81.3% of people stated that there was no difference in their usage patterns over the year, while 132 people (12.5%) use the Forest more in the summer than at any other time of the year (see **Table 3.6**). Of those people that did report higher usage at certain times of the year, the majority of people use the Forest more in the summer (82.5%) than at any other time (see **Figure 3.4**). Only 8% say they use the Forest more in autumn, with only 5.0% and 4.4% using the Forest more in winter and spring than at any other time of the year.

Only three sites, Fairwarp and Forest Row (pedestrian accesses) and Millbrook West (high usage car park) reported no difference in the usage throughout the year. The former are close to settlements while the latter is unusual in its usage patterns during the week. It is worth reiterating that the weather in late summer 2008 was less than clement, and there is the possibility that fewer tourists (as opposed to local residents) were encountered than might otherwise have been the case. Planned survey days were rearranged to avoid the worst of the weather, but there is still a risk that the typicality of results recorded suffered, particularly during the early part of the survey; see **section 3.3** for more on limitations.

Table 3.6: Visiting patterns by time of the year

Cat	Total number of groups	% of groups	Total number of people	% of people
Winter	6	1.0	8	0.8
Spring	3	0.5	7	0.7
Summer	76	12.0	132	12.5

Cat	Total number of groups	% of groups	Total number of people	% of people
Autumn	8	1.3	13	1.2
No variation	520	82.3	859	81.3
Don't know	19	3.0	37	3.5
Total	632*	100.0	1056	100.0

* There were seven missing values in this data set.

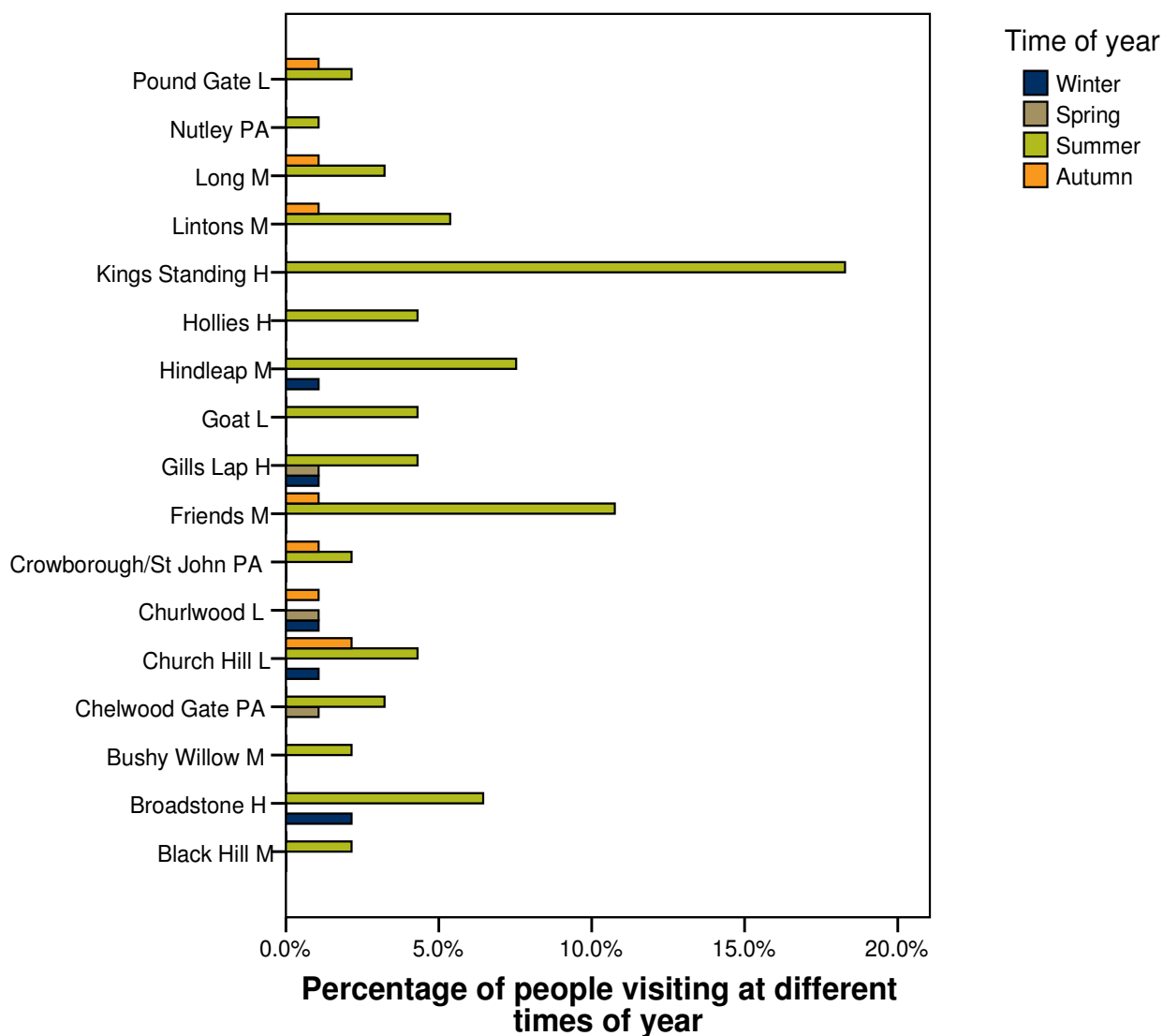


Figure 3.4: Usage by access point of people expressing a preference for visiting the Forest at certain times of year

3.2.8 Usage during different periods of the day/week

As part of the questionnaire, people were asked about the time of day they usually visit the Forest. Just under 60% of the people interviewed arrived at the site between 10am and 3pm. Only 13.0% of visitors arrived before 9am while 27.6% of people arrived between 5 and 7pm (see Table 3.7).

Table 3.7: Number of people and groups visiting the Forest by time of day

Time period interviewed	Total (no groups)	Percentage	Total (no of people)	Percentage
07:00 - 09:00	109	17.2	138	13.0
10:00 – 12:00	209	33.0	319	30.1
13:00 – 15:00	156	24.7	310	29.3
17:00 – 19:00	159	25.1	293	27.6
Total	633*	100%	1060*	100%

* There were six missing values in this data set.

The majority of people were interviewed in the time period at which they most frequently visited the Forest (see **Table 3.8**). People who were interviewed between 7 and 9am (79.5%) frequented the Forest at that time of the day most often. Similarly, just over half (52.4%) of people interviewed between 10am and 12pm visited the Forest most at that time. People interviewed between 1 and 3pm were more variable in their visiting time.

Table 3.8: Time of day most frequently visited in relation to the time of day interviewed (percentage calculated for rows)

Time period interviewed	Time of day most frequently visit (% of total)					
	Before 09:00	09:00 – 12:00	12:00-14:00	14:00 -16:00	After 16:00	Don't know / first visit
07:00 - 09:00	79.5	5.2	1.2	0.4	1.2	12.5
10:00 – 12:00	18.4	52.4	3.4	2.2	4.5	19.1
13:00 – 15:00	13.6	12.9	22.9	13.4	2.9	34.2
17:00 – 19:00	11.2	9.0	2.2	12.3	31.2	34.2
Total	23.8	23.3	8.2	7.7	10.7	26.4

The difference between weekdays and weekends was most noticeable in the 1-3pm time period, while the difference was least noticeable in the early mornings (7-9am); see **Figure 3.5**.

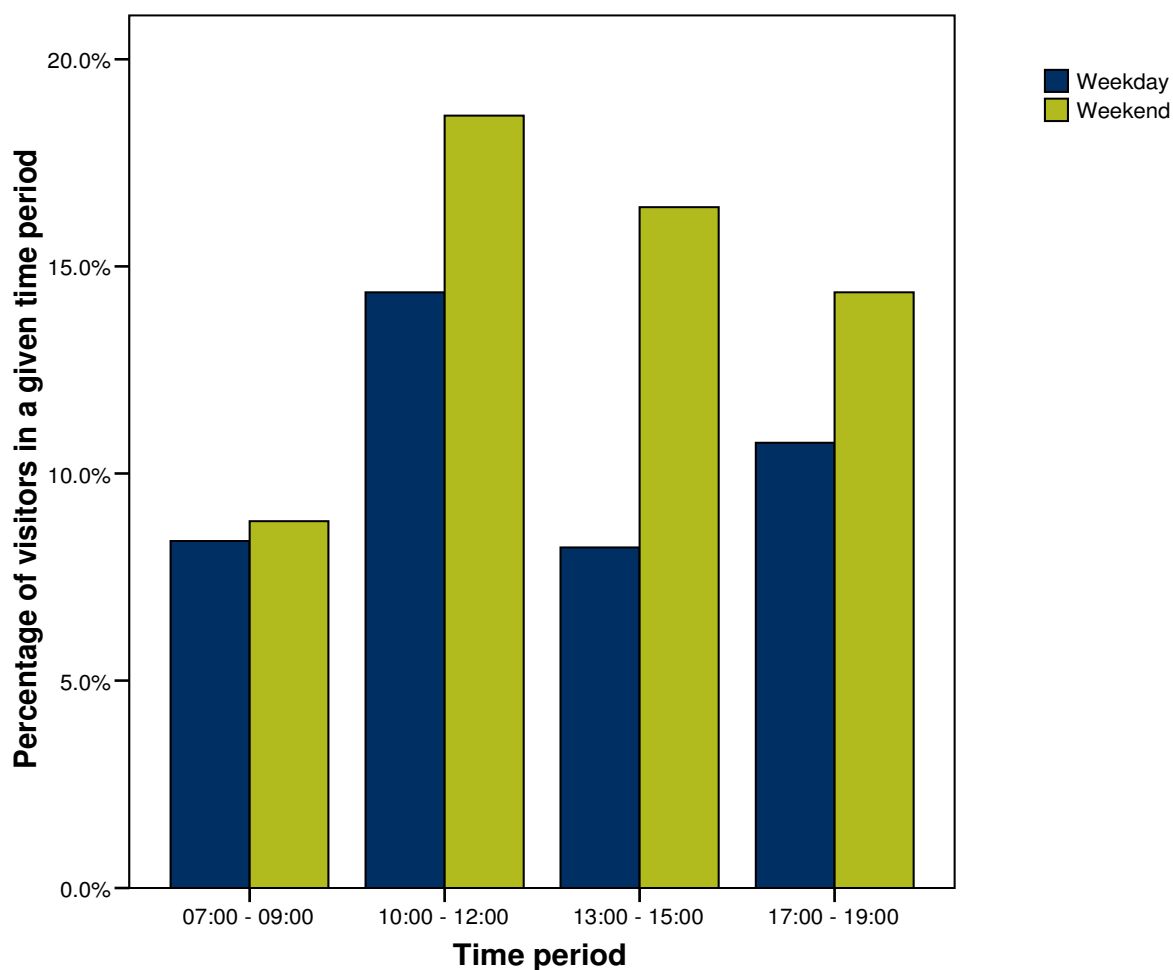


Figure 3.5: Proportion of visitors visiting at different times of day, during the week and at weekends

3.2.9 Reason for visiting the heath

All of the people interviewed were asked about the purpose of their visit to the Forest. They were able to specify one of seven reasons for their visit or were able to choose 'other' as a category, and were subsequently asked to specify their reason. People were able to choose more than one reason for visiting the Forest and as a consequence, 1,193 reasons were given for visiting the Forest; 144 people gave two reasons for visiting, while only two people gave three reasons for visiting.

By far the most common reason for visiting was to walk the dog (60.0%) followed by walking (30.0%). Horse riding, bicycling and running were each given as the reason for visiting by only 1.0% of the people interviewed. No one saw the Forest as a place to ride a motorcycle (see **Figure 3.6**). Only 5.3 % of people specified 'other' as their reason for visiting. Such reasons included:

Reason	No groups	Reason	No groups
Bird / nature watching	3	Mushrooming	4
Camping	1	Photography	5
Enchanted place	2	Recreational meeting	6

Exercise / sport	7	Relaxation	4
Family time	2	Sightseeing	4
Gliding	1	Visit for special occasion	3
Kite flying	2	Working in the area	4
Model aircraft	4		

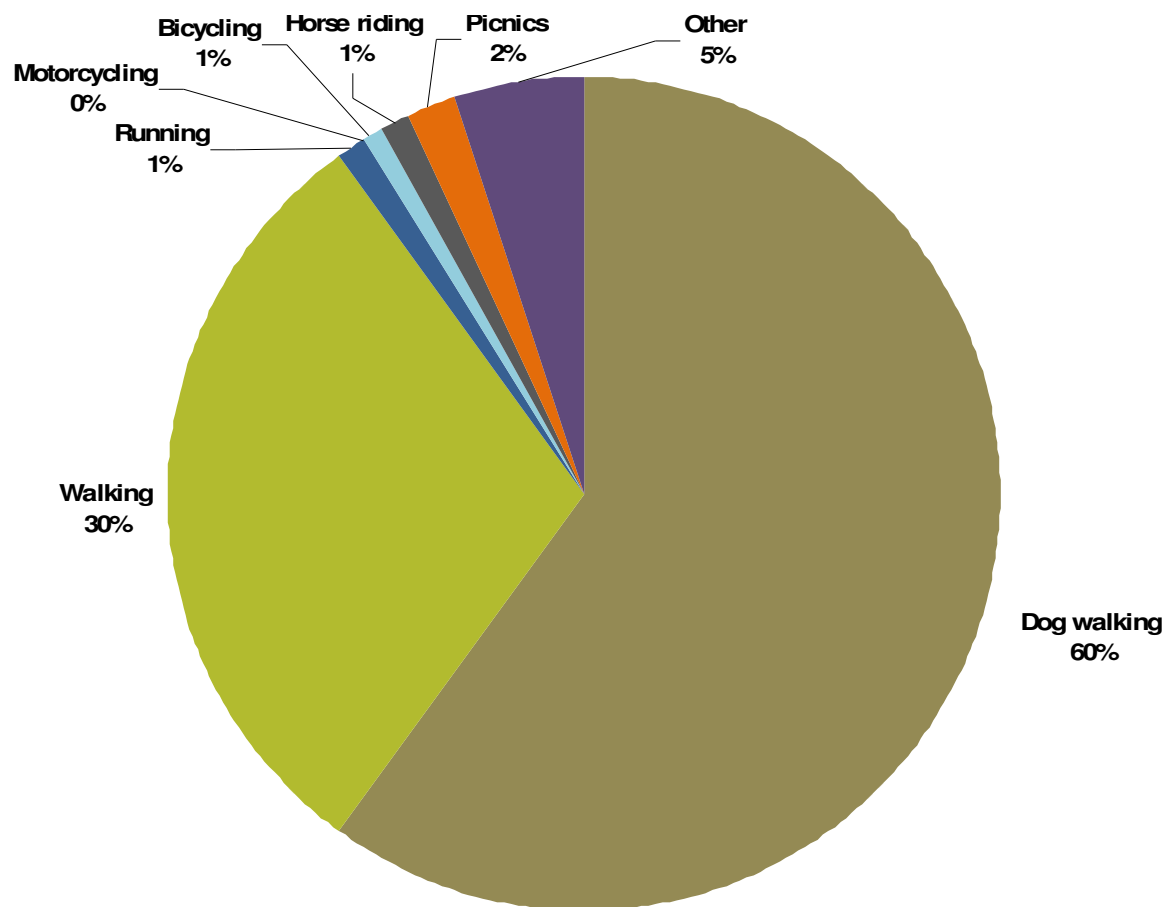


Figure 3.6: Reasons for visiting Ashdown Forest

The majority of pedestrian dog-walkers (63.6%) travel less than 4km on foot, to walk their dogs (see **Figure 3.7**) while 79.3% of motorised transport users travel less than 10km to walk their dogs, although there is no significant pattern (**Figure 3.8**); see also **section 3.2.10**.

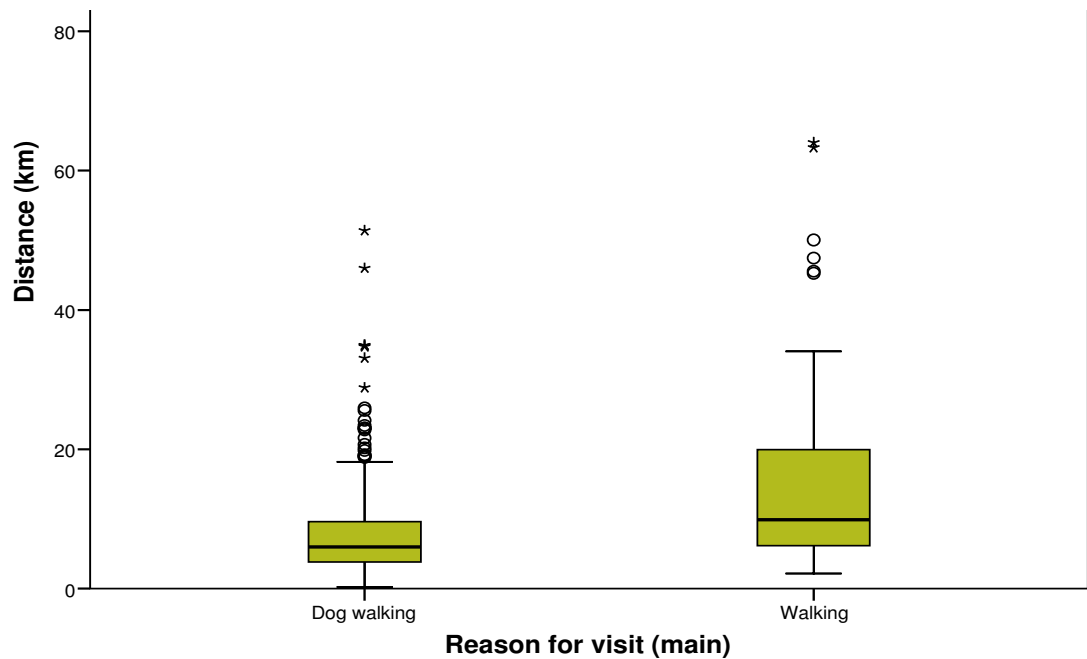


Figure 3.7: Reason for visit against distance travelled (Note: people travelling further than 100km have been excluded from the data)

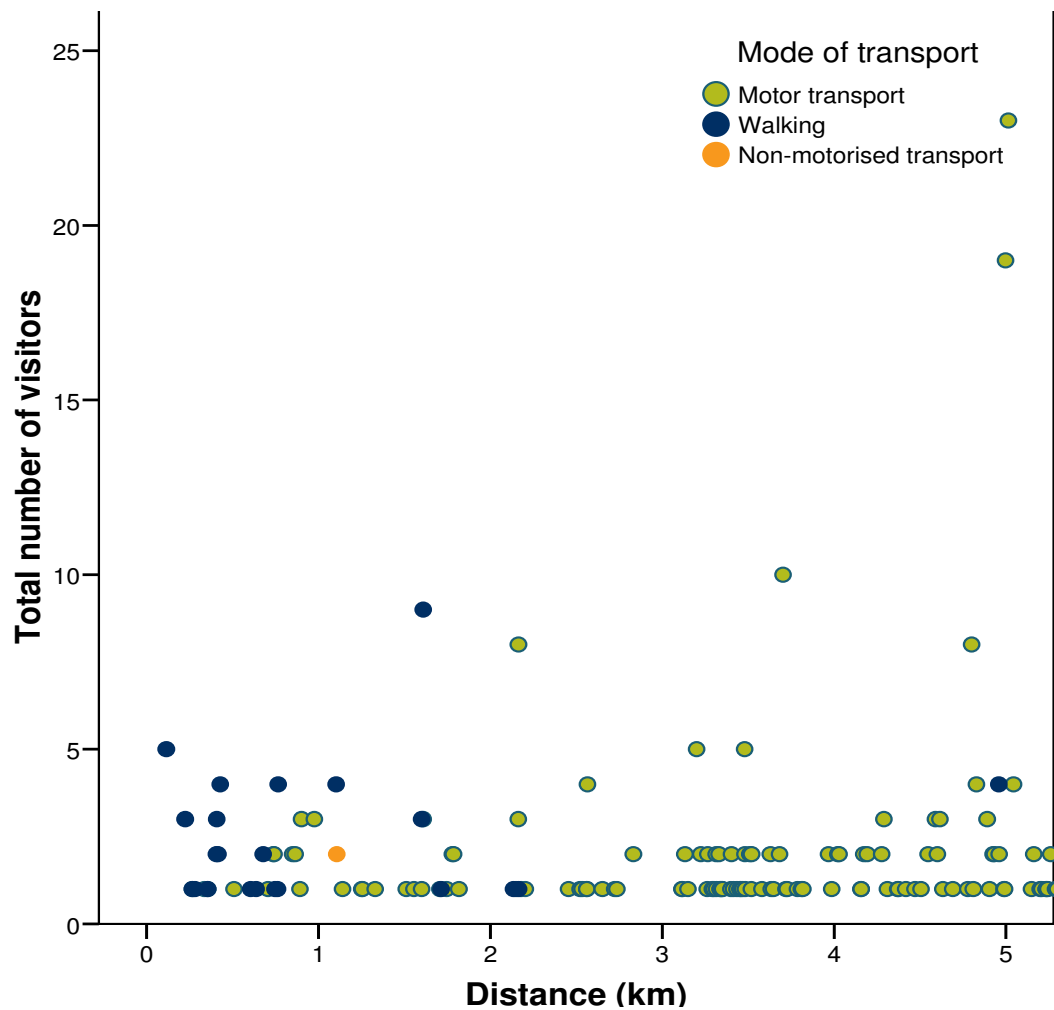


Figure 3.8: Number of dog-walkers travelling less than 5km to the access point

3.2.10 Mode of transport to heath access point

In order to assess access to the Forest by mode of transport, the data was categorised as follows:

- ▶ **Motorised transport** – cars, vans, coach/bus;
- ▶ **Non-motorised transport** – horses, bicycles and 'other'; and
- ▶ **Walking** – pedestrians.

The results are illustrated by access point in **Figure 3.9**, with the data shown in **Table 3.9**. Of the groups interviewed, 87.0% travelled by motorised transport to reach their access point, while 11.2% travelled by foot and 2.5% travelled by non-motorised transport.

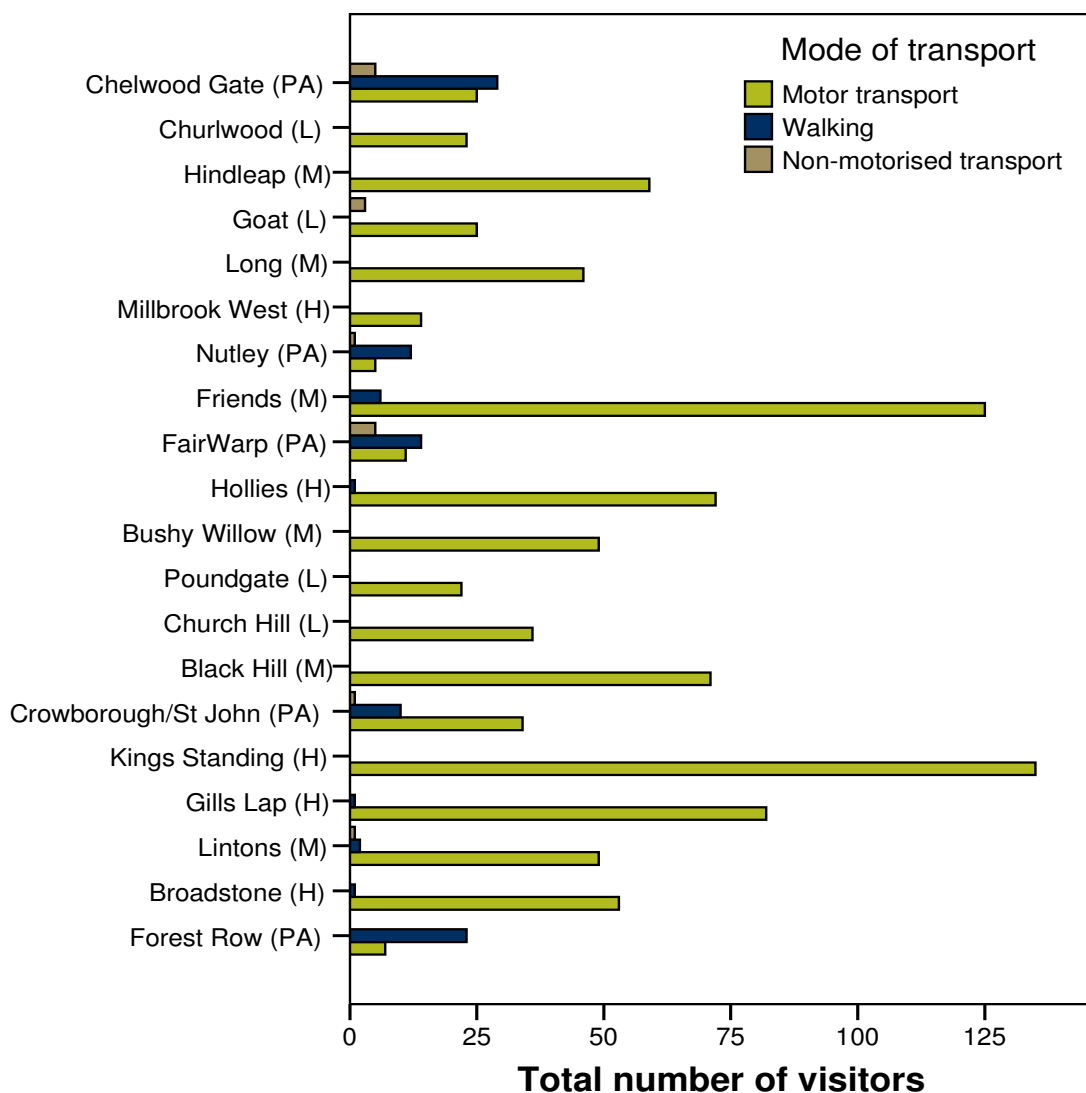


Figure 3.9: Access point by mode of transport

Table 3.9: Number of groups and visitors arriving at access points by mode of transport

Access point	Motor transport		Walking		Non-motorised transport		Total	
	No grps	Total visitors	No grps	Total visitors	No grps	Total visitors	No grps	Total visitors
Forest Row (PA)	6	7	18	23	0	.	24	30
Broadstone (H)	25	53	1	1	0	.	26	54
Lintons (M)	23	49	1	2	1	1	25	52
Gills Lap (H)	51	82	1	1	0	.	52	83
Kings Standing (H)	76	135	0	.	0	.	76	135
Crowborough (PA)	29	34	8	10	1	1	38	45
Black Hill (M)	48	71	0	.	0	.	48	71
Church Hill (L)	24	36	0	.	0	.	24	36
Poundgate (L)	15	22	0	.	0	.	15	22
Bushy Willow (M)	27	49	0	.	0	.	27	49
Hollies (H)	38	72	1	1	0	.	39	73
FairWarp (PA)	5	11	9	14	3	5	17	30
Friends (M)	54	125	2	6	0	.	56	131
Nutley (PA)	2	5	9	12	1	1	12	18
Millbrook West (H)	10	14	0	.	0	.	10	14
Long (M)	32	46	0	.	0	.	32	46
Goat (L)	15	25	0	.	2	3	17	28
Hindleap (M)	38	59	0	.	0	.	38	59
Churlwood (L)	16	23	0	.	0	.	16	23
Chelwood Gate (PA)	15	25	21	29	3	5	39	59
Total	549	943	71	99	11	16	631*	1058

* There were eight missing records in this dataset.

Of those people who specified that dog-walking was their primary reason for visiting (705 people), 88.1% came by car, while 10.6% came on foot. Of the remaining 1.2%; 0.7% came by van, 0.4% by bus and 0.1% took their dog for a walk by bicycle. There is no significant pattern between the distance dog-walkers will travel to the Forest, and their mode of transport (see **Figure3.10**).

3.2.11 Distances travelled to each access point

Distance to site was calculated from people's postcodes. Where postcodes were not supplied in full, the postcode stem was used as a proxy (as in Clarke *et al.* (2003) and Liley *et al.* (2006)). In total 565 distances were calculated and analysed. It would be expected that the number of visitors to an access point, or the Forest in general, would decline with distance, thereby providing an approximation of the Forest's catchment area which can help to predict the expected number of visitors as a result of changes in population density. Maps provided in **Appendix V** illustrate this section.

Analysis of variance revealed that there is a significant relationship ($p > 0.001$) between the type of access point and the distance people travel. On average, people travel less to get to the pedestrian access points (less than 5km; mean = 4.3km) than to the car parks (mean =

11.5km). Examination of the car parks by type indicated that people are likely to travel further to reach the high usage car parks (mean = 14.4km) than the medium (mean = 9.8km) and low usage (mean = 8.6km).

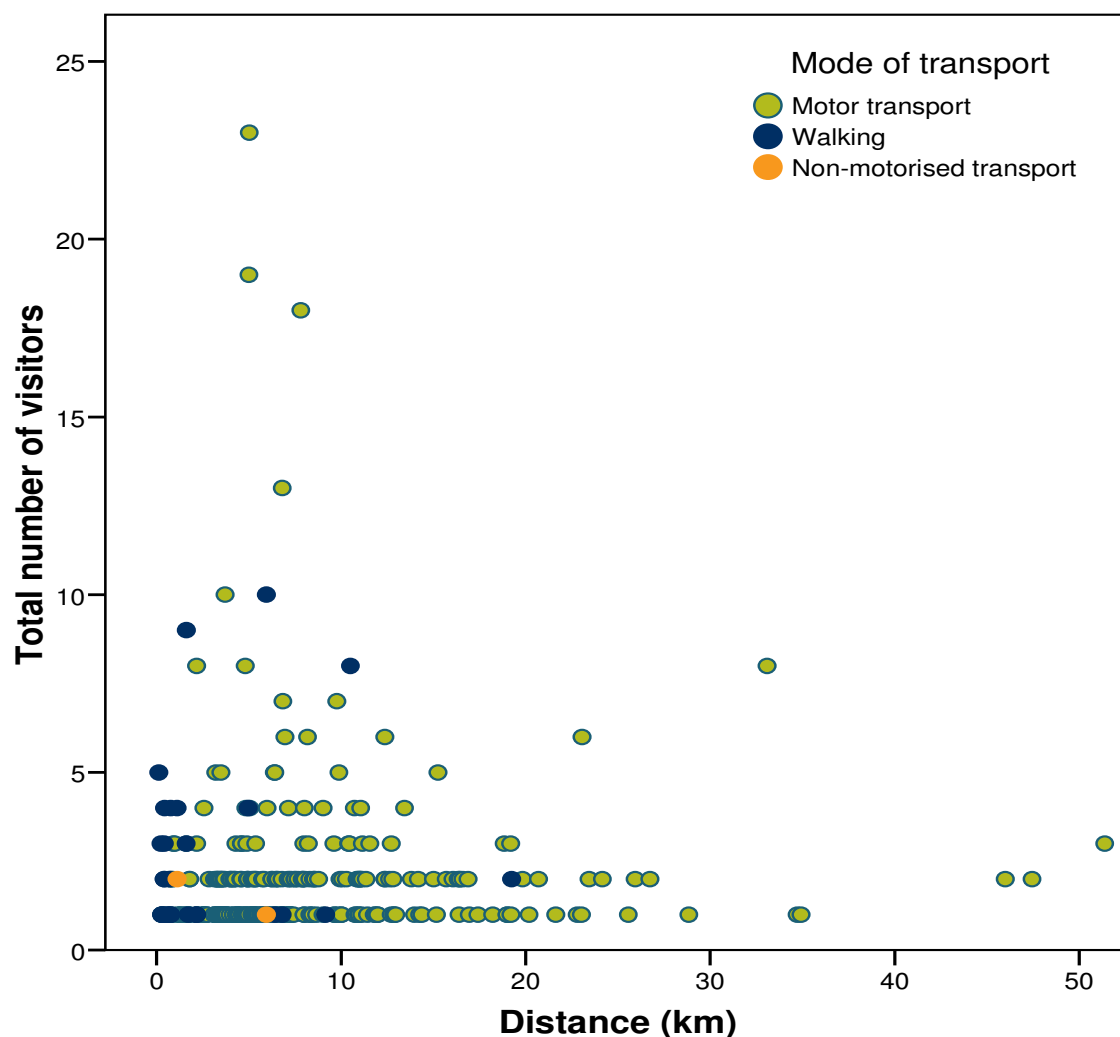


Figure 3.10: Number of dog-walkers travelling less than 50km to the access point, by mode

The exceptions were Forest Row and Millbrook West. Forest Row is a pedestrian access point where the average distance travelled was just 3.2km. Forest Row is a small town and the access point is near a recreation ground which may explain the low distance travelled to get there. Conversely, Millbrook West, a high usage car park, reported an average distance travelled to reach the access point of 40.3km. This reflects the position of the car park; it is on the A22 main arterial route between East Grinstead and Eastbourne, and therefore attracts a different profile of visitors to the other sites (see **Figure 3.11**). However, the classification of car park by local knowledge (classes of high, medium and low usage), although providing a pattern, does not explore the distance travelled by size of car park.

Overall, cars travel around 11km to the access points, while people on foot travel an average of 3.3 km. Of those travelling by motor vehicle, a small percentage travelled a considerable distance with the maximum recorded distance of 329.9km, while the majority travelled only a short distance. Some 40% travelled less than 5km, while nearly 85% travelled 10km or less, indicating significant usage by the local population.

Of those travelling on foot, almost 75% travelled less than 5km and 45% travelled less than 1km to the access point. Those visitors travelling less than 1km on foot accessed the Forest from Lintons, Friends and Forest Row. The 2.8% of respondents (or 16 groups) who travelled more than 7.5km on foot to reach the Forest are thought to have been passing through on a long distance route, such as the High Weald Landscape Trail or Vanguard Way. This includes one group of six recorded as originating from 10km away. Although a small proportion of the overall sample, these records, together with other factors unique to Ashdown Forest such as size and landscape quality, will contribute to a larger pedestrian catchment area than has been observed in similar studies elsewhere (see below). Overall the data indicated a significant source of traffic is from the local population (see **Tables 3.10** and **3.11** and **Figure 3.12**).

Table 3.10: Distance (km) travelled to each access point in the survey by transport mode

	Distance (km) to access point (calculated using postcodes)						
	Car	Van	Bus	M/c	Bicycle	Horse	Foot
Count (n)	538	6	3	2	3	8	71
Minimum	0.3	2.2	0.3	7.2	3.1	0.4	0.2
Maximum	329.9	28.8	15.2	13.8	49.1	12.3	19.2
Mean	10.9	14.7	8.0	10.5	19.4	2.7	3.3
Median	6.5	11.6	8.6	10.5	6.0	1.4	1.4
SD	23.5	10.7	7.5	4.6	25.7	3.9	4.2

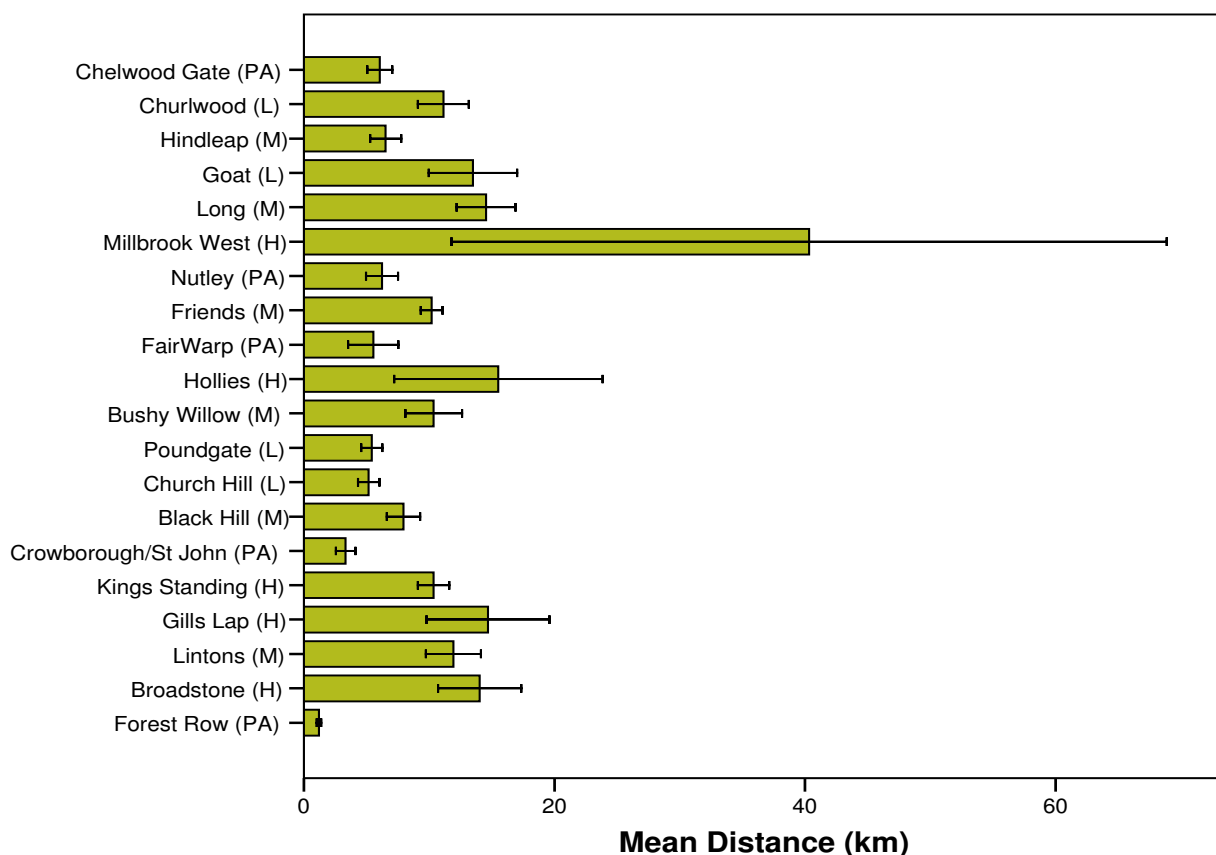


Figure 3.11: Mean distance travelled to each access point (error bars +/-1SE)

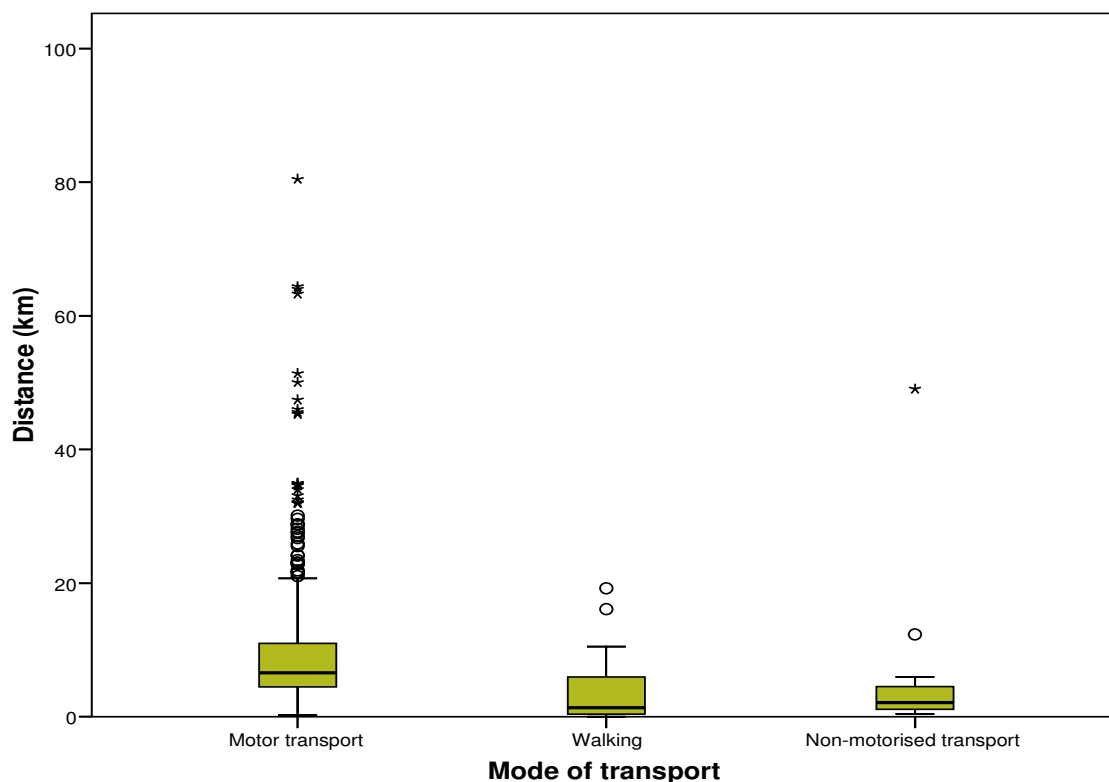


Figure 3.12: Mean and all distances travelled by mode of transport

The cumulative frequency of distances travelled to the access points, by mode of transport, provides an illustration of the catchment area of the Forest (**Figure 3.13a&b**). Table 3.11 shows that 42.6% of those travelling on foot come from within 800m of the Forest, whereas the 7.5km distance band contains 70.4% of those travelling by motor transport as well as 90.2% of those on foot. No pedestrians, and only 4.9% of those travelling by vehicle, come from beyond 12.5km, suggesting a local catchment area of 13km. These data could, with information pertaining to the capacity of the Forest to assimilate current recreational impacts, inform and identify any necessary mechanisms to protect the conservation objectives of the SPA from the impacts of new development. This may include setting buffer zones and/or providing alternative recreation land, as described in Policy NRM6 of the South East Plan.

A brief comparison with data recorded at the Thames Basin Heaths and Dorset Heathlands sites is worthwhile; the distance visitors to Ashdown are willing to travel is generally higher, providing an indication of the site's draw as a 'destination' and, perhaps, its qualities as a contiguous whole (see **section 3.2.21** for more on this). At Thames Basin Heaths therefore, '40% [of 723 people who gave a postcode] travel by foot [and] come from within the 400m distance band, the 1,500m distance band includes 20% of car drivers and 90% of those arriving by foot, and no walkers and only 30% of car drivers came from beyond 5km' (Liley et al., 2006). Meanwhile at Dorset Heathlands, of the 632 people interviewed, 'three-quarters came on foot lived and travelled less than 500m away, whereas only 2% of people arriving by car/van lived within the same distance. Ninety percent of people walking to a heath access point lived within 1,100m and 95% had travelled no more than 3,000m. In contrast, half of the people coming by car lived an estimated 3.7km or more away and 10% of those driving to the site lived at least 8.8km away'.

Table 3.11: Percentage of people travelling within a given distance, by mode of transport

Distance band (m)	Motorised		Bicycle		Horse		On Foot	
	%	Cum. %	%	Cum. %	%	Cum. %	%	Cum. %
200	0.88	0.88	0.00	0.00	0.00	0.00	0.00	0.00
400	1.11	1.99	0.00	0.00	0.00	0.00	13.11	13.11
600	0.22	2.21	0.00	0.00	12.50	12.50	14.75	27.87
800	0.66	2.88	0.00	0.00	12.50	25.00	14.75	42.62
1,000	1.99	4.87	0.00	0.00	0.00	25.00	1.64	44.26
1,500	0.88	5.75	0.00	0.00	25.00	50.00	4.92	49.18
2,000	2.43	8.19	0.00	0.00	12.50	62.50	18.03	67.21
3,000	5.31	13.50	0.00	0.00	25.00	87.50	3.28	70.49
4,000	13.27	26.77	50.00	50.00	0.00	87.50	0.00	70.49
5,000	14.38	41.15	0.00	50.00	0.00	87.50	3.28	73.77
7,500	29.20	70.35	50.00	100.00	0.00	87.50	16.39	90.16
10,000	14.38	84.73	0.00	100.00	0.00	87.50	1.64	91.80
12,500	10.40	95.13	0.00	100.00	12.50	100.00	8.20	100.00
15,000	4.87	100.00	0.00	100.00	0.00	100.00	0.00	100.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

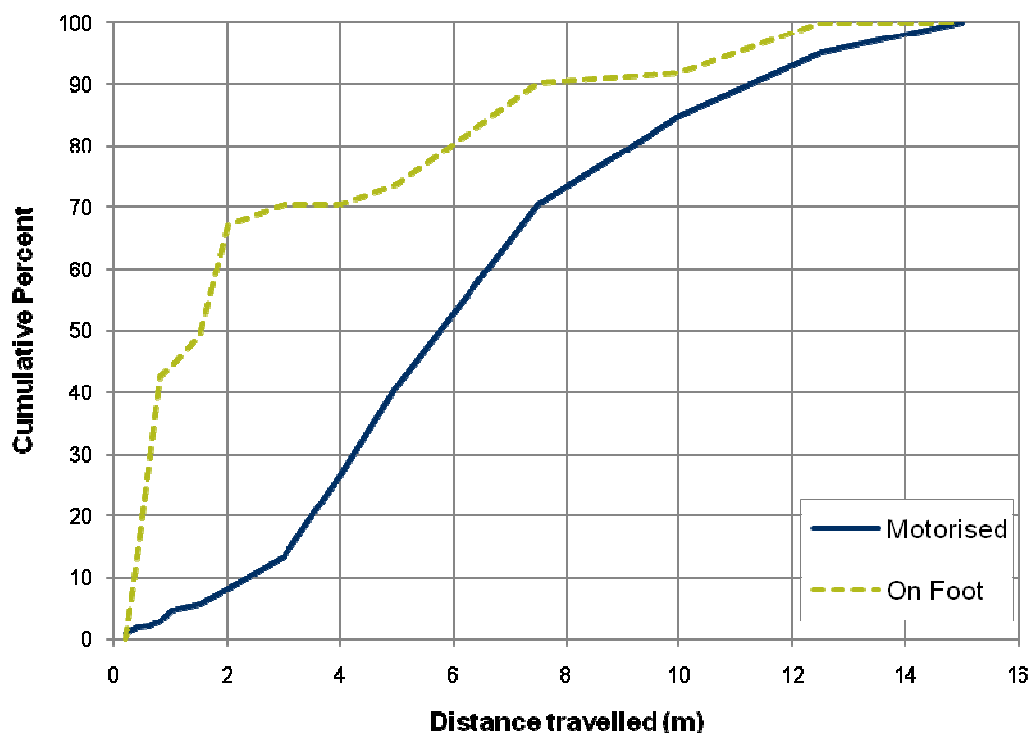


Figure 3.13a: Cumulative frequency distribution curve of the distance travelled to the Forest (long x axis)

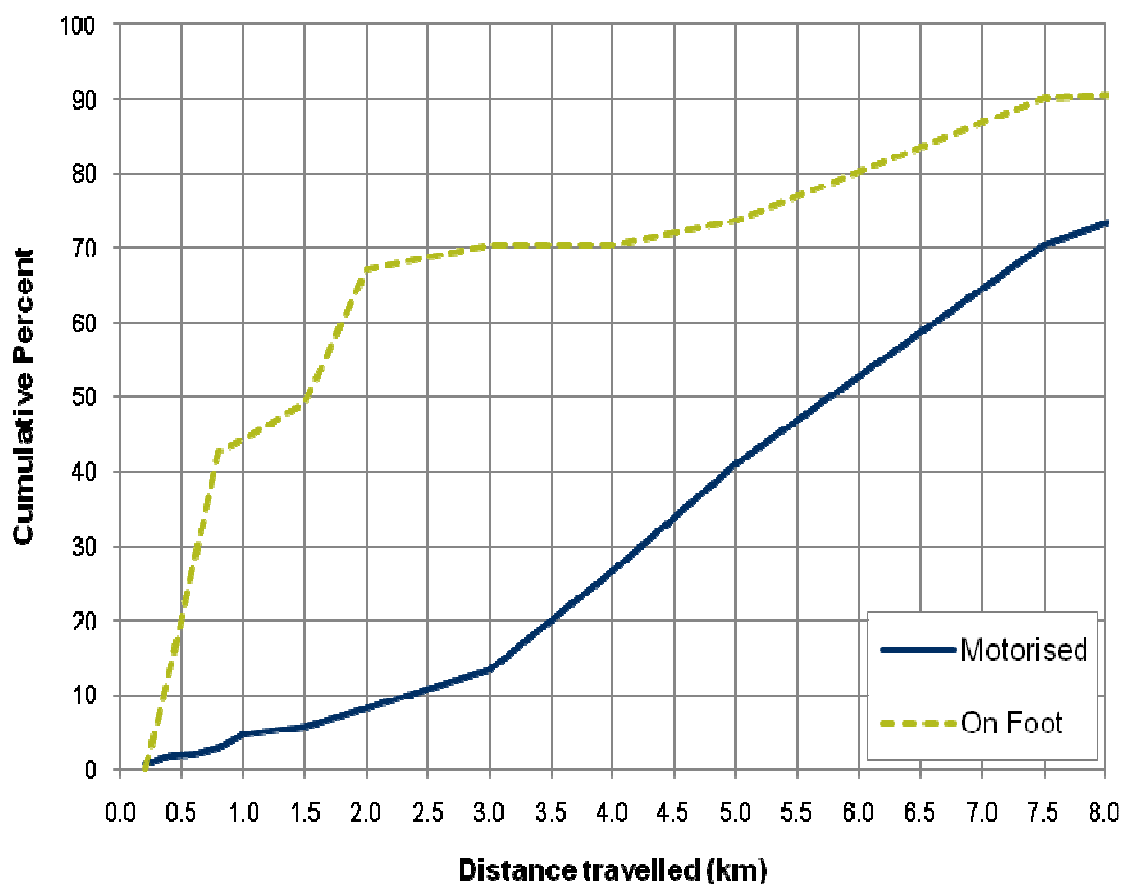


Figure 3.13b: Cumulative frequency distribution curve of the distance travelled to the Forest (short x axis)

Focusing in on visitors originating from Mid Sussex and Wealden districts, **Table 3.12** and **Figure 3.14** illustrate the distances travelled by residents of these districts to reach Ashdown Forest. The data shows that, whilst only 10% of visitors from Mid Sussex travel less than 3km to reach the Forest (because the Forest falls mostly outside of district boundaries), almost 70% travel less than 7.5km, and more than 90% travel less than 10km to reach Ashdown. Turning to Wealden residents, some 45% of visitors travel less than 2km to reach the Forest while 73% travel less than 3km and 91% travel less than 4km.

Table 3.12: Percentage of people travelling within a given distance, by mode of transport

Distance band (m)	Mid Sussex			Wealden		
	No.	%	Cum. %	No.	%	Cum. %
200	0	0.00	0.00	46	12.07	12.07
400	0	0.00	0.00	24	6.30	18.37
600	0	0.00	0.00	18	4.72	23.10
800	1	1.11	1.11	13	3.41	26.51
1,000	0	0.00	1.11	26	6.82	33.33
1,500	0	0.00	1.11	20	5.25	38.58
2,000	1	1.11	2.22	21	5.51	44.09
3,000	7	7.78	10.00	110	28.87	72.97
4,000	14	15.56	25.56	69	18.11	91.08
5,000	29	32.22	57.78	11	2.89	93.96
7,500	10	11.11	68.89	8	2.10	96.06
10,000	20	22.22	91.11	3	0.79	96.85
12,500	3	3.33	94.44	3	0.79	97.64
15,000	2	2.22	96.67	8	2.10	99.74
>15,000	3	3.33	100.00	1	0.26	100.00
Total	90	100.00	100.00	381	100.00	100.00

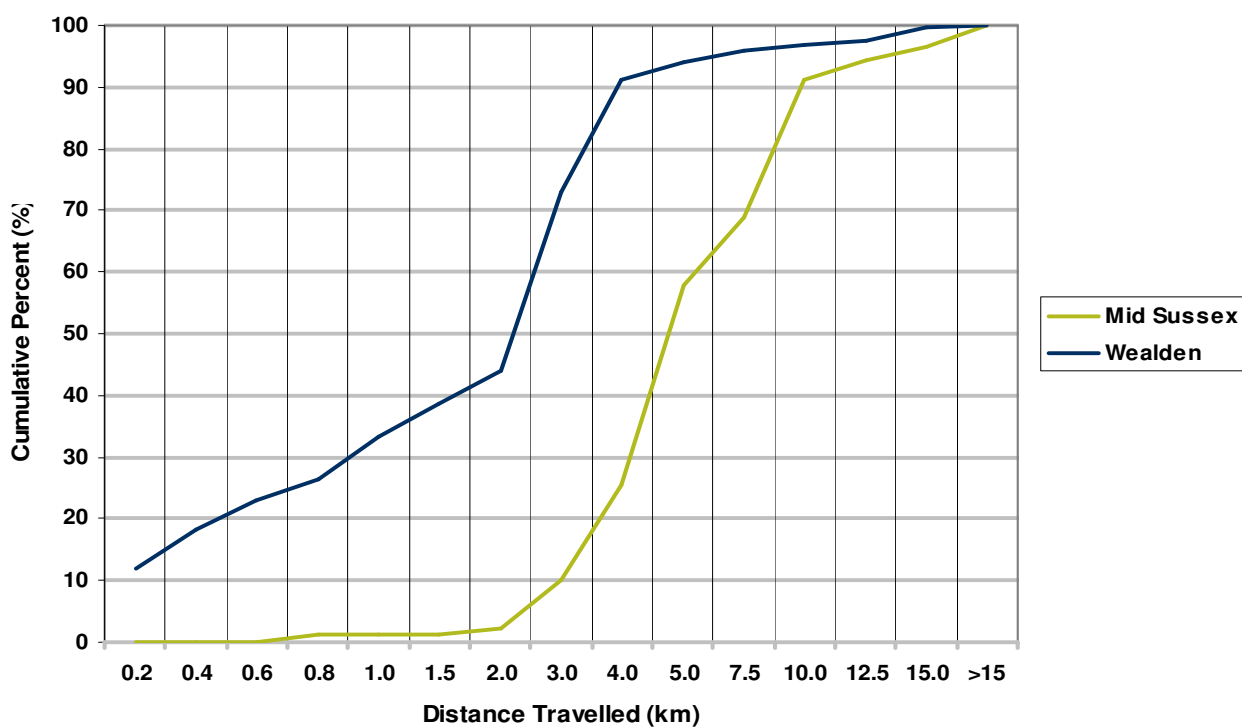


Figure 3.14: Cumulative frequency distribution curve of the distance travelled to the Forest (Mid Sussex and Wealden residents only)

Returning to the full dataset, people were asked about their primary reason for visiting the Forest and their postcode. Overall, there were 482 groups of people visiting expressly for dog-walking, while only 134 groups arrived for non-dog-walking purposes. The majority of people visiting for non-dog-walking purposes (e.g. walking, running, horse riding cycling or picnicking) travelled an average distance of 15.8km (Standard Error (SE)=2.14) while those accessing the Forest to walk their dog travelled on average only 8.4 km (SE 0.94) (see **Table 3.13** and **Figure 3.15**). There was considerable variation by access point however, with people travelling furthest to Gill's Lap (note the large SE) for non dog-walkers.

For dog-walkers, the average distance travelled to each access point was generally less and the standard error smaller. Only at four of the five pedestrian access points, and Hindleap (medium usage) and Millbrook West (high usage), did people travel further to walk their dogs than non dog-walkers (Table 3.13).

Table 3.13: Distance (km) travelled to access points by dog-walkers and non-dog-walkers

ID	Sample Access Point	Non dog-walkers			Dog-walkers		
		No Groups	Mean (km)	SE of Mean	No Groups	Mean (km)	SE of Mean
1	Forest Row PA	3	0.88	0.37	23	1.24	0.20
2	Broadstone H	12	22.35	6.44	14	6.89	0.98
3	Lintons M	9	12.19	4.90	14	11.77	2.01
4	Gills Lap H	15	31.63	15.44	34	7.23	0.56
5	King's Standing H	10	21.13	6.20	64	8.67	0.95
6	Crowborough / St John PA	3	6.00	3.63	36	3.19	0.79
7	Black Hill M	4	21.19	13.85	43	6.53	0.56
8	Church Hill L	3	12.59	1.03	18	3.94	0.61
9	Pound Gate L	1	9.89		14	5.10	0.84
10	Bushy Willow M	4	21.65	14.36	23	8.40	1.02
11	Hollies H	11	10.06	2.78	28	17.66	11.58
12	Fairwarp PA	7	4.40	2.76	10	6.34	2.90
13	Friends M	22	12.44	1.60	31	8.59	0.88
14	Nutley PA	1	5.95		11	6.27	1.40
15	Millbrook West H	1	32.11		9	41.23	31.89
16	Long M	4	26.01	10.02	25	12.70	2.12
17	Goat L	7	20.30	6.52	8	7.53	1.89
18	Hindleap M	5	4.16	1.13	34	6.87	1.40
19	Churlwood L	3	16.13	6.04	14	10.06	2.11
20	Chelwood Gate PA	9	4.70	1.76	29	6.49	1.19
Total		134	15.82	2.14	482	8.35	0.94

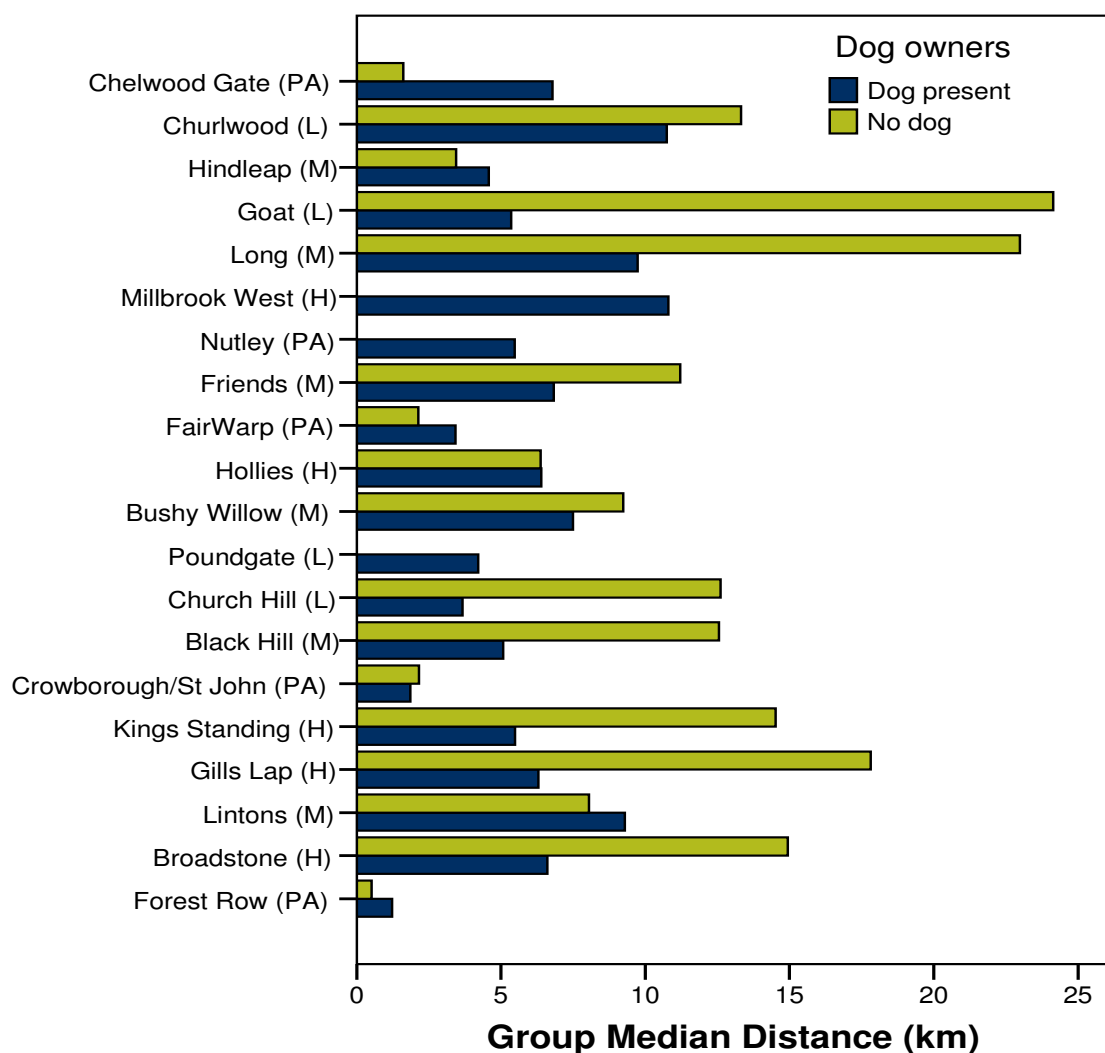


Figure 3.15: Median distance travelled to access points by dog- and non-dog-walkers

3.2.12 Distances and route travelled from each heath access point

Each questionnaire respondent was asked to draw the route they took on the Forest on an OS map (see also **section 2.9**). The routes have been digitised using GIS to explore any patterns in the density of visitor activity in parts of the Forest. To set the scene, maps at **Appendix VI** illustrate the extent of habitat types of interest (wet and dry heathland) overlaid with known Dartford warbler and nightjar breeding bird territories (BTO, 2004).

It is possible that areas towards the middle of Forest's open access land, or areas away from the access points, are more heavily visited than areas close to entry, due to the routes taken and any overlapping of these routes (see also Liley *et al.*, 2006). If this is the case it might be expected that breeding birds would avoid such areas, where there is a higher incidence of disturbance events. The routes taken by visitors on the Forest have been overlaid with the breeding bird territory and habitat data, to provide an illustration of the spatial coincidence of the datasets. This is presented in the maps at **Appendix VII** (without a base map), and discussed further at **section 4.5**, while **Appendix VIII** shows the same data including the base map.

Each route was assigned two numerical descriptors: the total length of their journey on the Forest, and the 'penetration distance' of that route (ie, the linear distance from their point of access to the part of their route furthest from the access point). The total lengths of routes travelled are shown in **Table 3.14**, while penetration distances are given in **Table 3.15**.

Table 3.14: *Length (m) of route travelled on Forest, by user type*

Cat	Count (n)	Minimum	Maximum	Mean	Standard Deviation
Dog walking	439	85	9,094	2,588.6	1,255.3
Walking	103	407	9,138	2,588.5	1,464.4
Running	5	1,393	3,925	2,490.2	1,076.6
Motorcycling	0	0	0	-	-
Bicycling	1	1,368	1,368	-	-
Horse riding	5	4,019	5,369	4,795.6	552.9
Picnic	3	530	2,242	1,494.3	876.3
Other	18	192	7,666	2,060.9	1,840.3
Total	574	-	-	-	-

Table 3.15: *'Penetration distance' (m) travelled, by user type*

Cat	Count (n)	Minimum	Maximum	Mean	Standard Deviation
Dog walking	439	35	3,682	871.8	500.9
Walking	103	68	4,359	867.3	546.0
Running	5	463	1,242	746.6	313.8
Motorcycling	0	0	0	-	-
Bicycling	1	308	308	-	-
Horse riding	5	767	1,891	1,211.2	440.9
Picnic	3	198	667	499.7	261.8
Other	18	129	1,635	518.3	370.9
Total	574	-	-	-	-

The data shows that, while the average dog-walker will travel around 2.5km while on the Forest, they will only venture a mean 968.8m from their access point. Conversely, walkers will travel an average 2.8km but penetrate 1,034.0m onto the Forest. These data are further illustrated in **Figures 3.16** and **3.17**, while **Figures 3.18** and **3.19** depict the cumulative frequency of route lengths and penetration distances. **Figure 3.20** shows the mean penetration distances of dog-walkers and other users by access point.

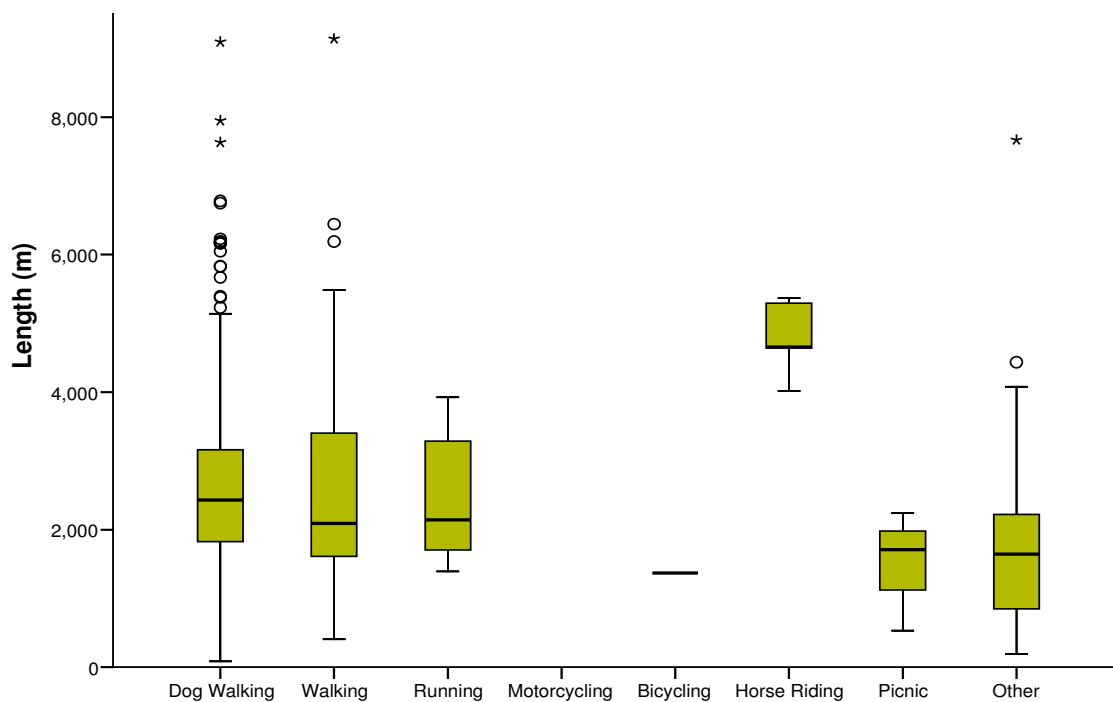


Figure 3.16: Length (m) of routes travelled, by user type

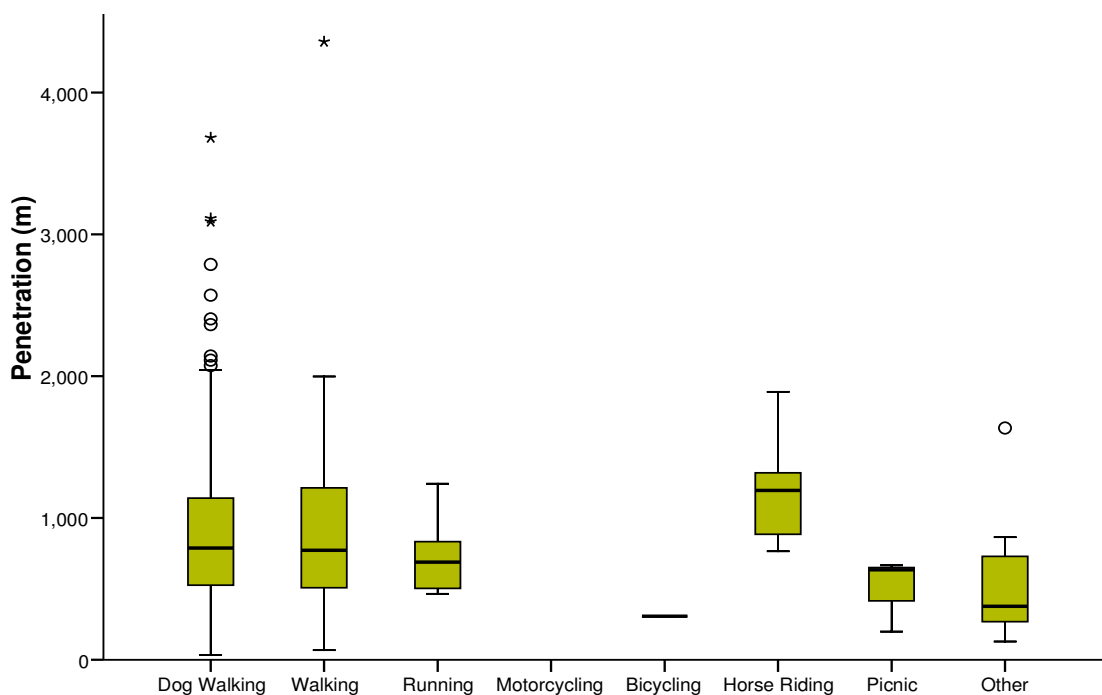


Figure 3.17: 'Penetration distances' (m) travelled, by user type

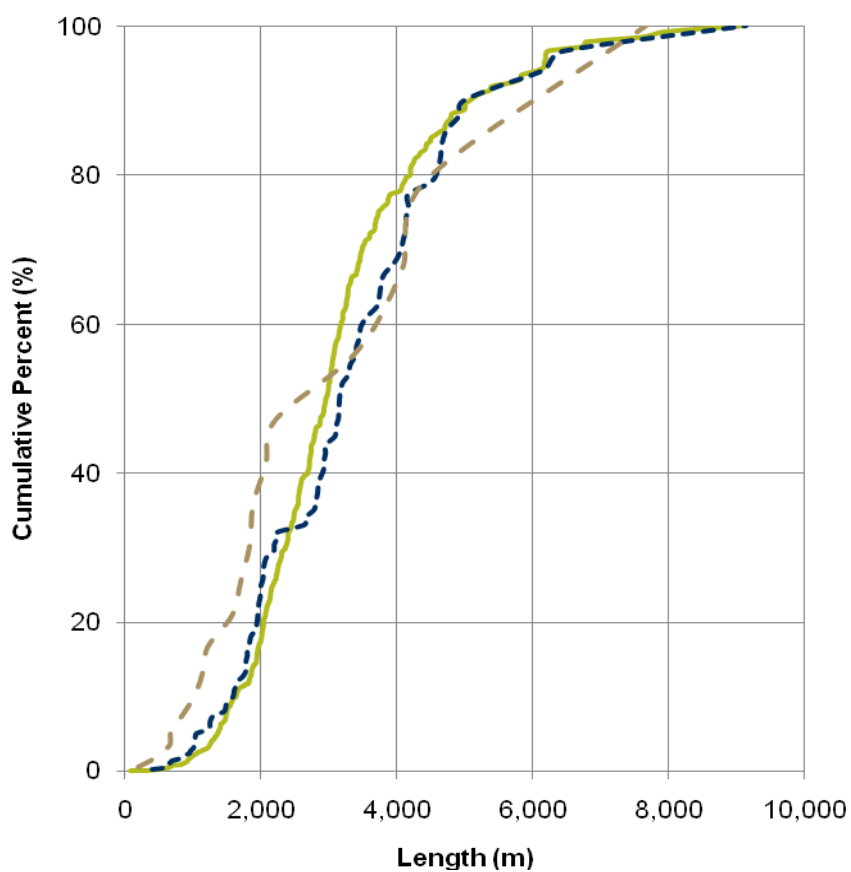


Figure 3.18: Cumulative percentages of route length, by user type

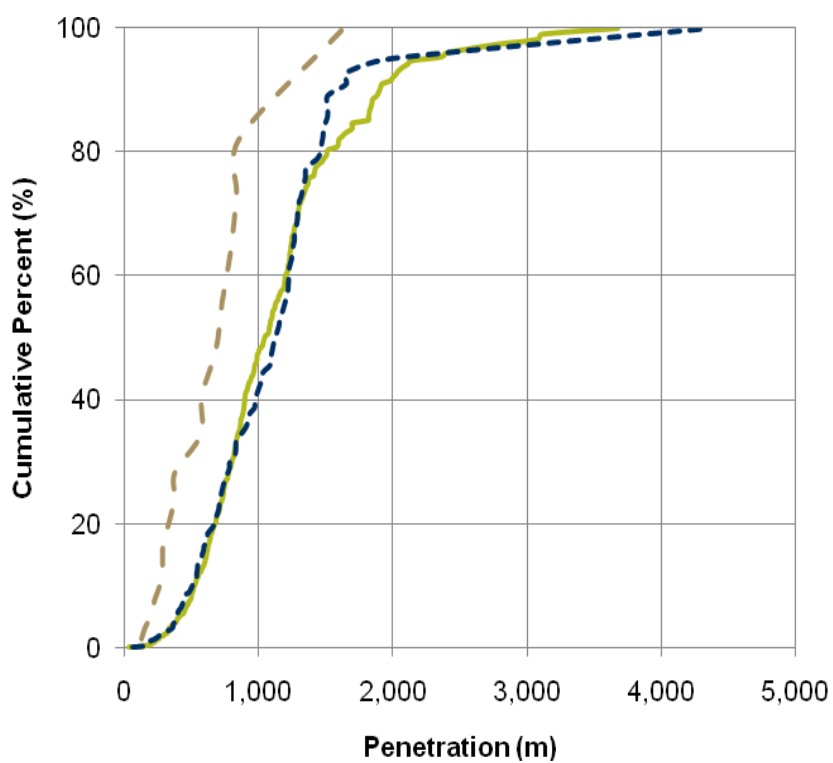


Figure 3.19: Cumulative percentages of 'penetration distance', by user type

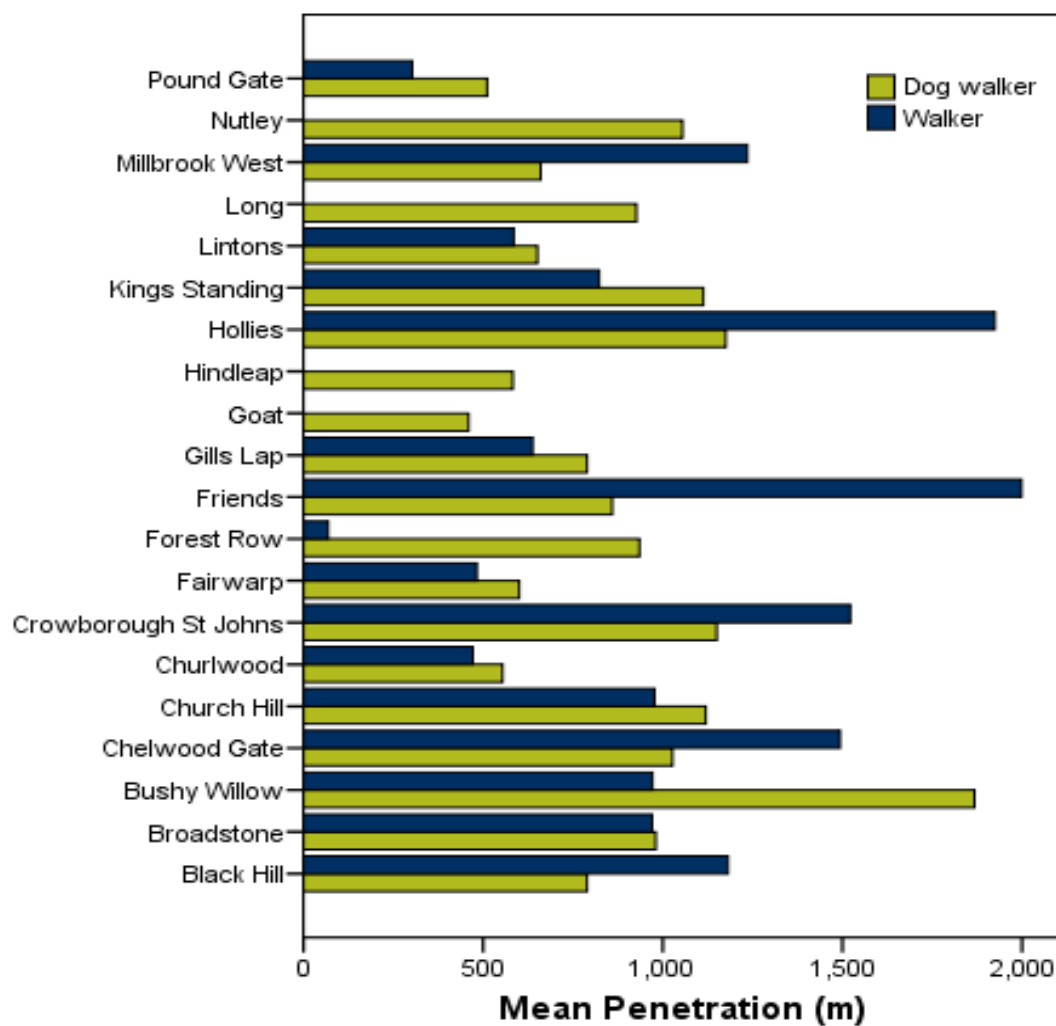


Figure 3.20: Mean penetration distances of walkers and dog-walkers, by access point

3.2.13 Dog-walkers on and off the path

Three quarters of the people accessing the Forest travelled 'mostly on the tracks' during their activities. Only 9.9% spend most of their time off the main tracks, while 15.1% travel equally on and off the tracks (see **Table 3.16**). When examined by purpose of visit, non dog-walking activities were combined for analysis. There was no significant difference between dog-walkers and non-dog-walkers (74.8% and 78.4% respectively; see **Figure 3.21**).

Table 3.16: Time spent on and off tracks by user type

Cat	Non-dog-walking		Dog-walking		Total	
	Count	%	Count	%	Count	% (col)
Mostly on the tracks	29	78.4	360	74.8	389	75.0
Equal time both on and off tracks	6	16.2	72	15.0	78	15.1
Mostly off the tracks	2	5.4	49	10.2	51	9.9
Total	37	100	481	100	518	100

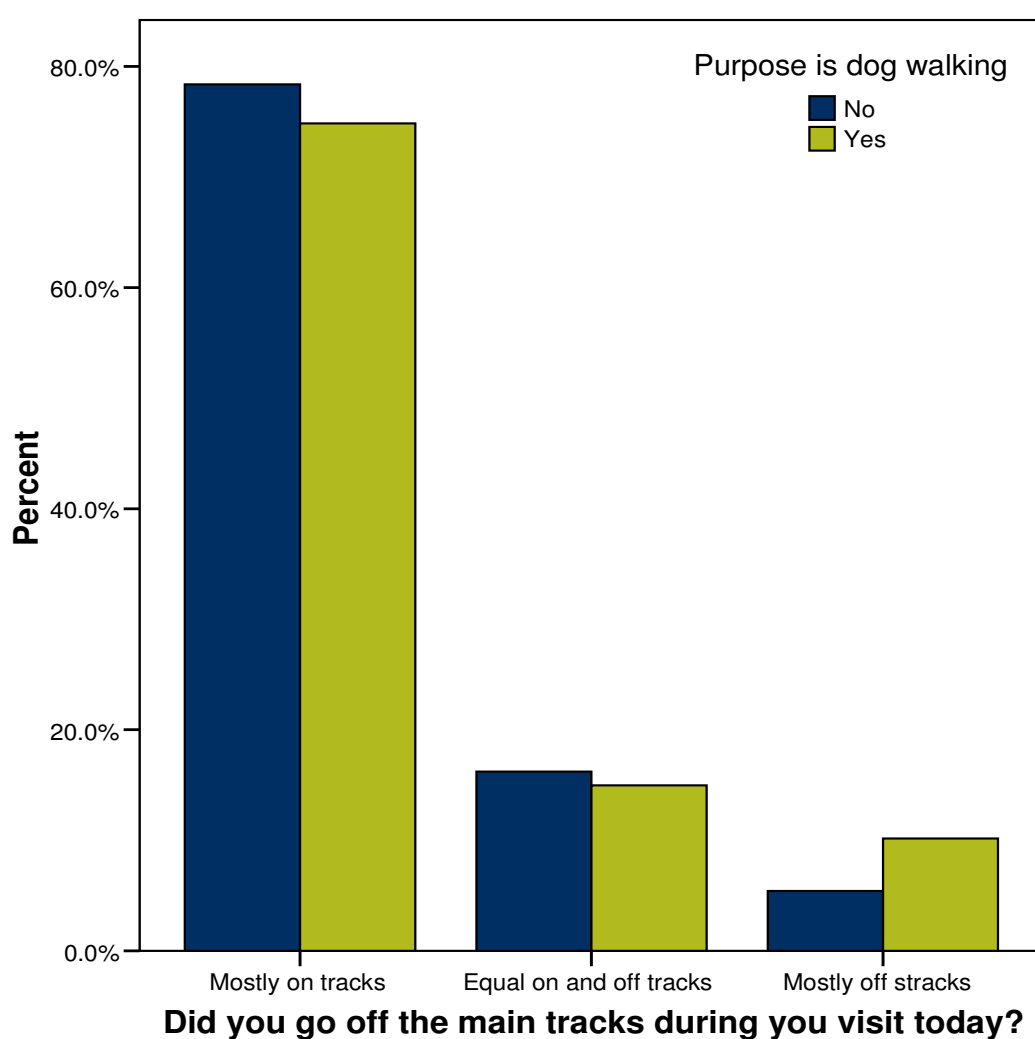


Figure 3.21: Time spent on and off the tracks by user type

3.2.14 Dogs on and off the lead

People with dogs were asked about their behaviour during their time in the Forest; 79.3% of people allowed their dog off the lead for the majority of their walk. Seventeen people stated that this was one of the key attractions for visiting the Forest, while two stated that they enjoyed the fact there was 'wildlife for their dog(s) to chase'. Only 5.4% kept their dog on the lead for all of the walk.

This pattern however, varies between access points. At Lintons (a medium usage access point) 100% of dogs are off the lead for all or most of their walk. Nutley and Chelwood Gate, both pedestrian access points, also have high numbers of dogs off the lead (90.9% and 96.4% respectively). Conversely, Fairwarp, which is also a pedestrian access point, recorded only 42.9% of dogs off the lead all of the time. Similarly, Friends, a medium usage access point with high numbers of visitors, had lower numbers of dogs off the lead compared to other sites (59.4%). King's Standing (high usage access point) a busy car park with the highest number of visitors, was however, close to the overall average with 77.3% of dogs allowed off the lead for most or all of the walk (see **Figure 3.22a** and **3.22b**).

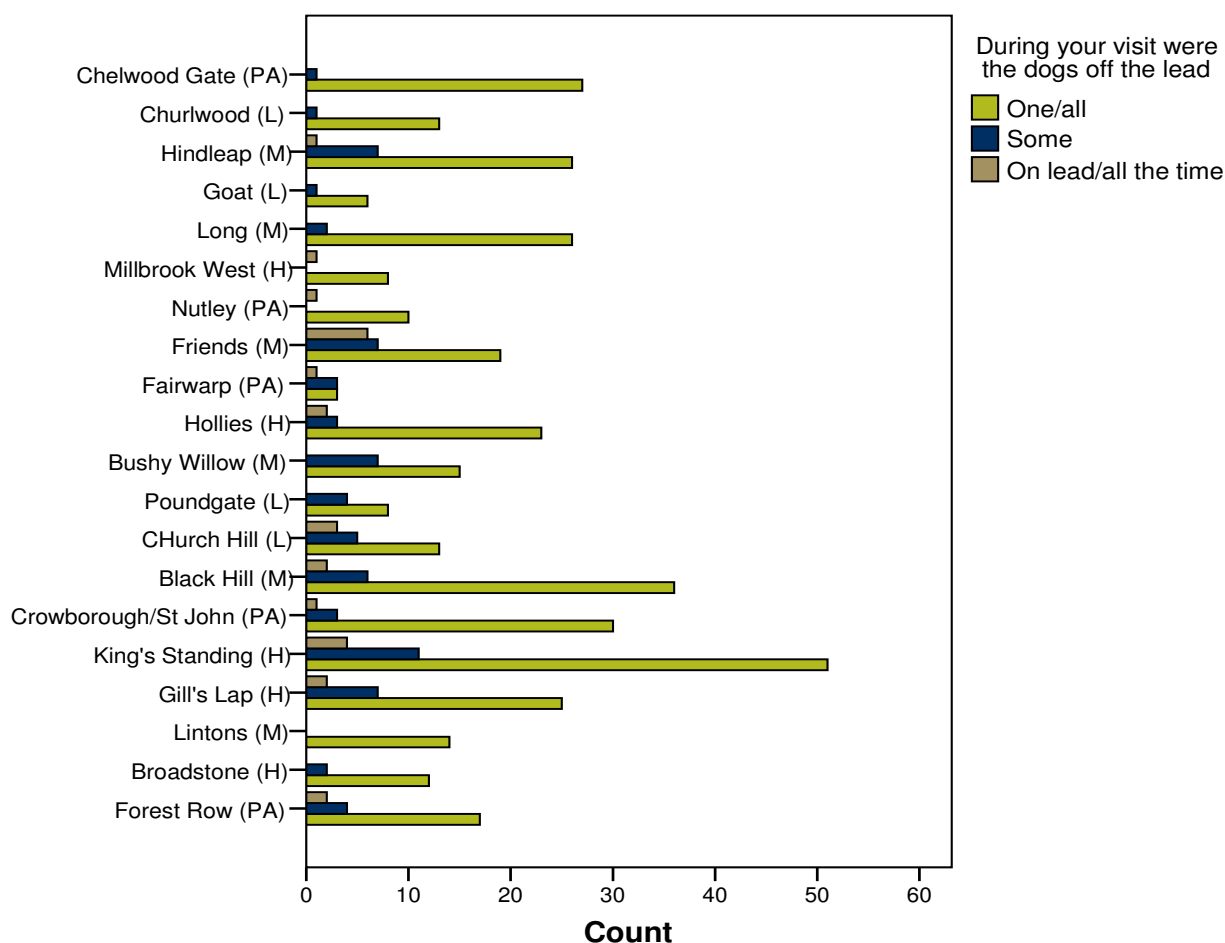


Figure 3.22a: Time dogs spend off the lead by access point

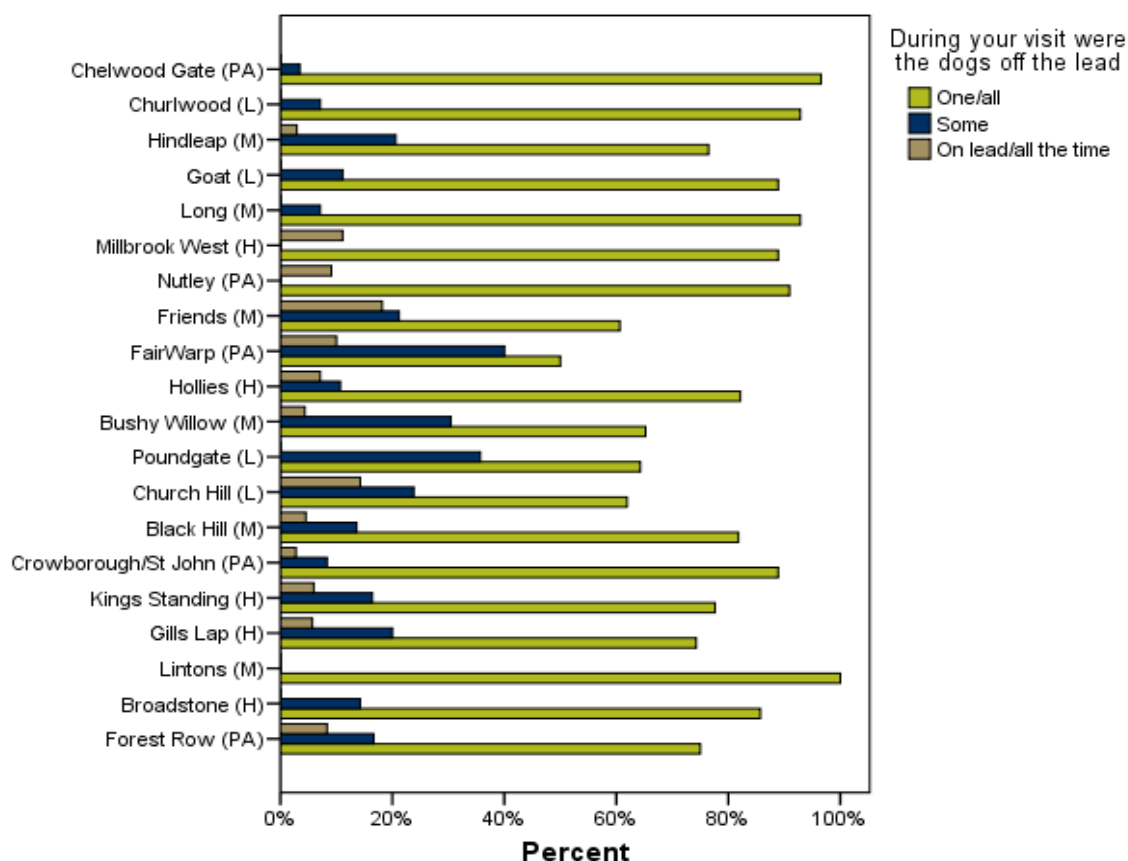


Figure 3.22b: Percentage of dog-walkers allowing dogs off the lead, by access point

3.2.15 Visitor numbers and parking

Car parking provision was variable across the access points. No sites had access to a WC and only six sites had an information board of some kind. Five sites, chosen as pedestrian access points had no parking provision or limited parking (nearby street, or grass verge for example). Despite this, a total of 79 people arrived by car at these sites which means that on average, one car arrived at each pedestrian access point on an hourly basis. These sites have different usage patterns, however, compared to the recognised car parks, recording higher numbers of pedestrians per hour per site (1.10 people) compared to the other sites which all recorded less than 0.1 person arriving on foot per hour per site (see **Table 3.17**).

After consultation with the Conservators, cars parks were classified on their expected usage based on the rangers local knowledge. Interestingly the six 'medium usage car parks' (mean parking space = 30.8) recorded a similar number of cars per hour per site (4.0) compared to the five 'high usage car parks' (4.41) (Table 3.17). Overall, there is no significant difference between 'medium' and 'high' usage car parks, and this is therefore not a useful distinction. The data was reclassified based on the size of the car park using the following categories:

- ▶ **Pedestrian access:** no parking spaces (n=5);
- ▶ **Small car park:** less than 16 spaces (n=5);
- ▶ **Medium car park:** between 16 and 30 spaces (n=4); and
- ▶ **Large car park:** greater than 30 spaces (n=6).

Using car park size as a basis for analysis, the proportion of people using cars to arrive to each type of site correlates as expected. Less than 1 car an hour per site uses pedestrian access points, while small car parks record 2.1 cars per hour per site. The number increases to 3.4 and 4.7 for medium and large car parks respectively. Cyclists prefer to make use of the pedestrian access points and small car parks (0.01 and 0.04 per hour, respectively) but overall have very a low usage pattern. Similarly, horse riders also prefer the less busy areas and pedestrian access points (see **Table 3.18**).

Table 3.17: No of people per hour by type of access point

Mode of transport	Pedestrian access (n=5)		Low usage (n=4)		Medium usage (n=6)		High usage (n=5)	
	No people	No/ hr / site	No people	No/ hr / site	No people	No/ hr / site	No people	No/hr / site
Car	79	0.99	103	1.61	384	4.00	353	4.41
Van/bus	3	0.04	3	0.05	15	0.16	0	0.00
Motorcycle	0	0.00	0	0.00	0	0.00	3	0.04
Bicycle	1	0.01	3	0.05	0	0.00	0	0.00
Horse	11	0.14	0	0.00	1	0.01	0	0.00
On foot	88	1.10	0	0.00	8	0.08	3	0.04
Total	182	2.28	109	1.70	408	4.25	359	4.49

Table 3.18: No of people per hour by size of car park

Mode of transport	Pedestrian access (n=5)		Small car park (n= 5)		Medium car park (n=4)		Large car park (n=6)	
	No people	No/ hr / site	No people	No/ hr / site	No people	No/ hr / site	No people	No/hr/ site
Car	79	0.99	168	2.10	219	3.42	453	4.72
Van/bus	3	0.04	13	0.16	2	0.03	3	0.03
Motorcycle	0	0.00	0	0.00	0	0.00	3	0.03
Bicycle	1	0.01	3	0.04	0	0.00	0	0.00
Horse	11	0.14	1	0.01	0	0.00	0	0.00
On foot	88	1.10	2	0.03	6	0.09	3	0.03
Total	182	2.28	187	2.34	227	3.55	462	4.81

3.2.16 Types of visitor at different types of access point

A comparison of which type of visitors most commonly visit different types of access point could inform changes in site management, helping to draw visitors away from more sensitive areas. **Figures 3.23** and **3.24** show the mean distance travelled by different types of visitor (walkers, dog-walkers, joggers and so on) in relation to the type of access point (both

typologies are used here; 'low', 'medium' and 'high' usage, and small, medium and large car parks, plus pedestrian accesses). Perhaps unsurprisingly, the data illustrates a general trend of people travelling further to reach the larger / more popular access points.

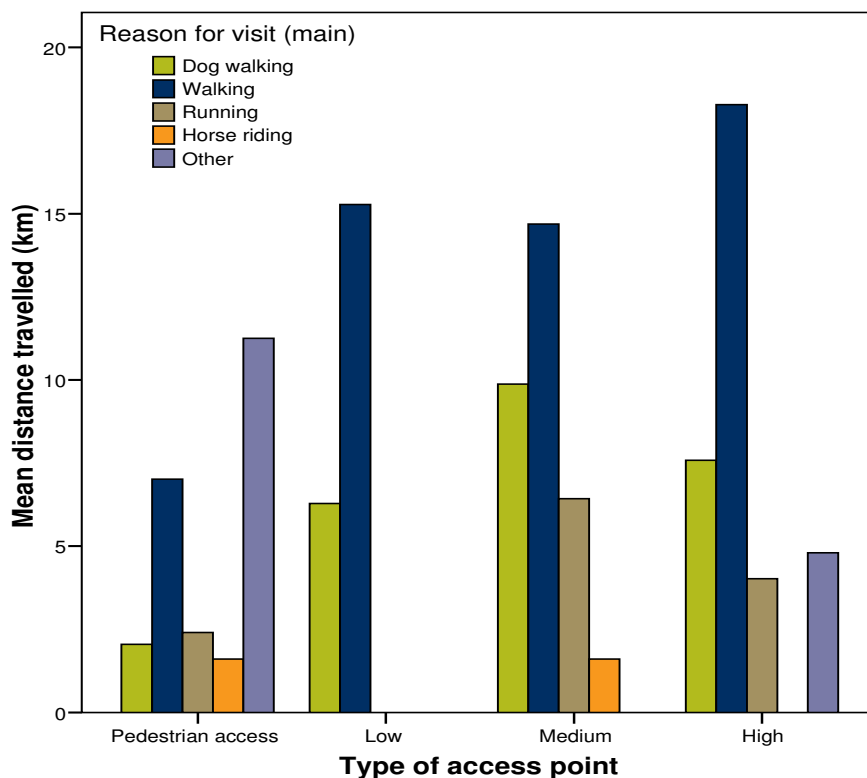


Figure 3.23: Mean distance travelled to types of access point, by reason for visit

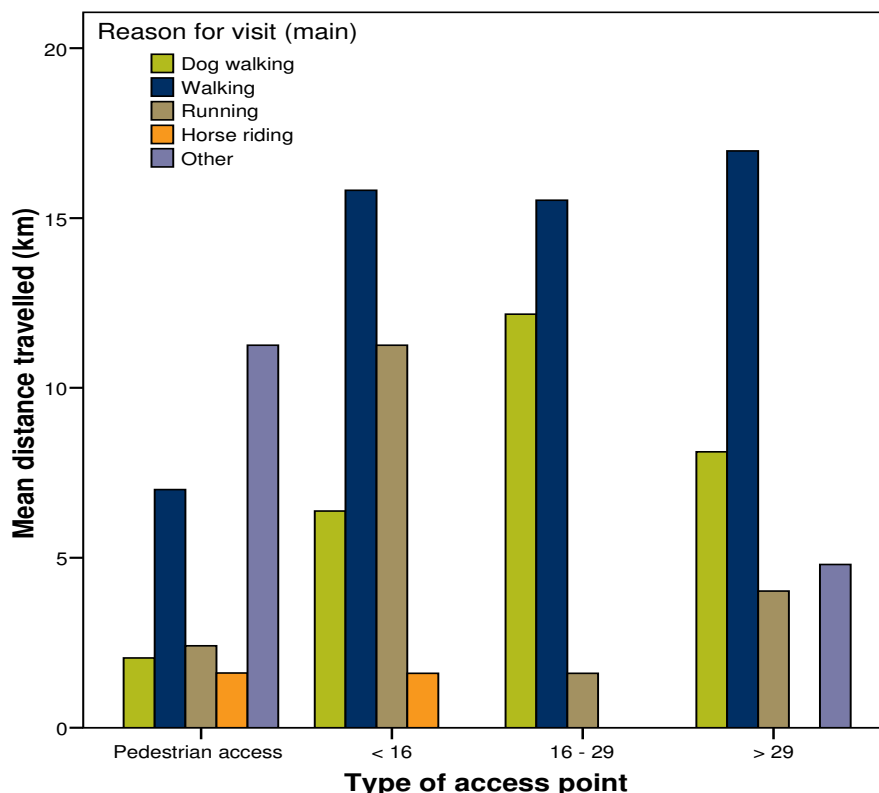


Figure 3.24: Mean distance travelled to car parks of different sizes, by reason for visit

3.2.17 Willingness to pay for parking

Of the 639 people who answered the questionnaire, 98.9% expressed an opinion about paying for parking. Of those that answered, 56.7% said they would pay a parking charge, 38.3% said they did not want to pay to park and only 4.8% did not know (see **Figure 3.25a**).

Those people who said they would pay for parking were then asked how much they would be prepared to pay. Only 206 interviewees (57.2%) volunteered an amount per visit. A number people (12.6%) suggested they would be willing to pay for a permit on an annual basis while 180 (87.4%) stated they would be prepared to pay per visit. The average amount people would be prepared to pay for an annual permit to park was £33.33, while the average per-visit amount was £1.30 (see **Figure 3.25b** and **3.25c**). Nine people although not specifying a value, commented that they feel they 'already pay / donate' to the upkeep of the Forest; others commented that they would donate if the Forest car parks had better facilities such as 'litter bins', improved security', 'cycle facilities', or that the 'money went to the upkeep of the Forest'. An annual permit for regular / local users was also raised by a number of visitors.

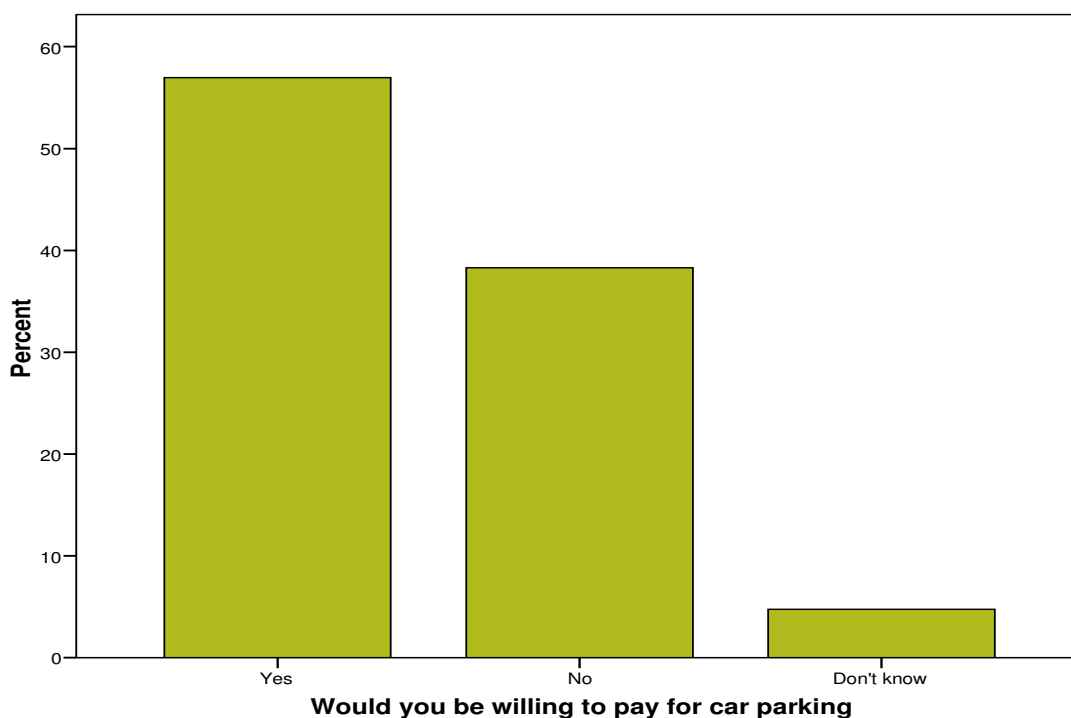


Figure 3.25a: Proportion of visitors willing to pay for car parking

Willingness to pay was then examined by those who use the Forest for dog-walking purposes and those that come for other reasons. There was very little difference in the responses between these groups, with people who do not use the Forest primarily for dog-walking being slightly more inclined to pay than those who do (65.5% and 54.1% respectively; see **Table 3.19**). Consideration of the amount these two groups would pay, however, indicated that there was a difference in the average amounts. Non dog-walkers (n=45) were happy to pay an average of £2.60 (SD7.5) while dog-walkers would pay an average of twice as much £5.80 (SD12); see **Figure 3.24d**.

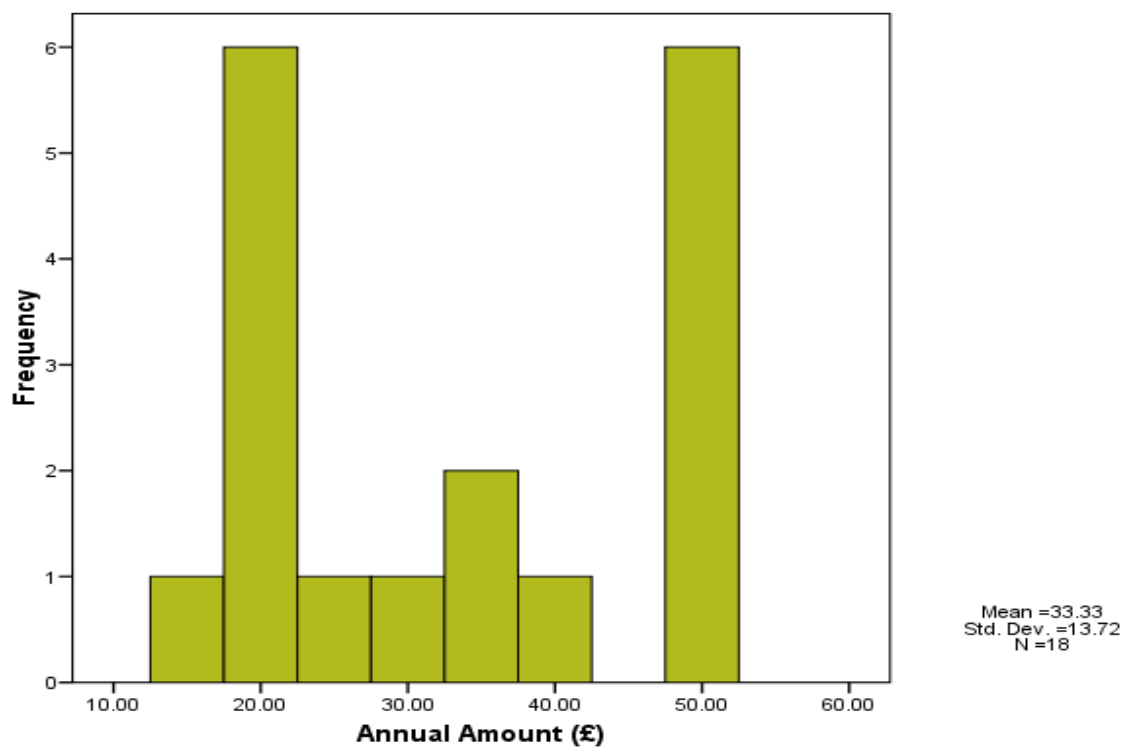


Figure 3.25b: Willingness to pay for car parking on an annual basis

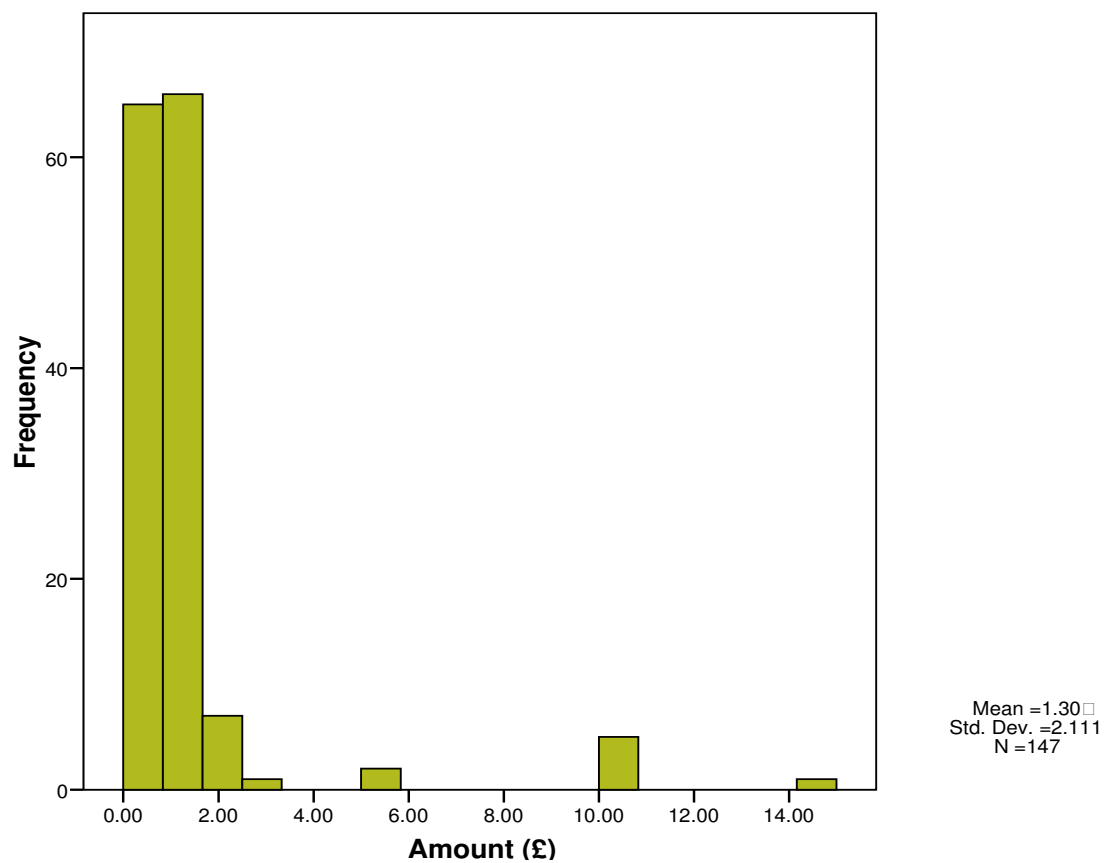


Figure 3.25c: Willingness to pay for car parking on a per-visit basis

Table 3.19: Willingness to pay for parking, by user type

	Non-dog-walkers		Dog-walkers	
	Frequency	Percent	Frequency	Percent
Yes	91	65.5	261	54.1
No	45	32.4	194	40.2
Don't Know	3	2.2	27	5.6
Total	139	100.0	482	100.0

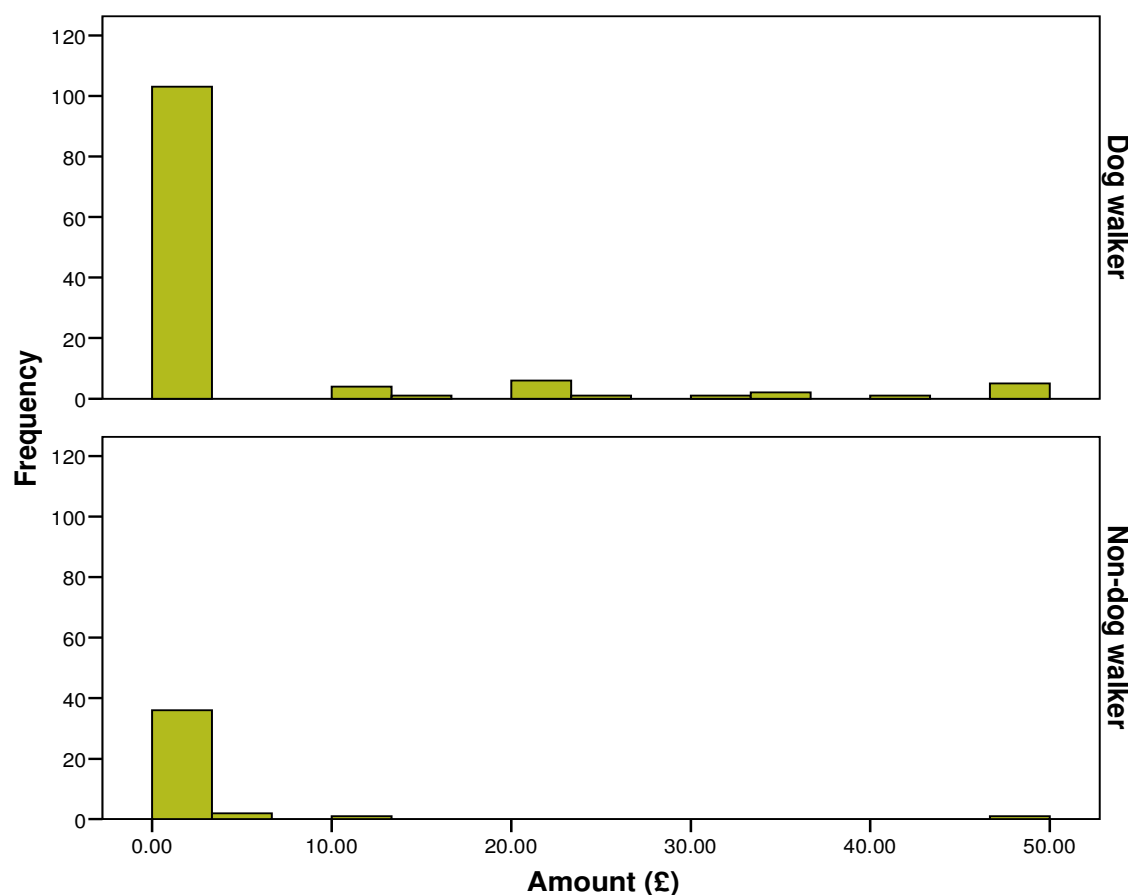


Figure 3.25d: Amount visitors are prepared to pay for parking, by user type

3.2.18 Alternative sites

Questionnaire respondents were asked whether or not they visited any other alternative sites for the same primary purpose as they were visiting the Forest. Quite a range of sites was given, including some interesting spelling variations, and so sites were grouped according to type. This part of the survey was answered by 399 groups (62.4% of the full sample), with the remaining 37.6% of groups either not using alternative sites or not willing to answer this section. Within this dataset, 18.4% use an alternative site in the Forest (ie, a different access point to the one at which they were interviewed), while 28.3% visit land with a similarly open aspect. In addition, 20.9% visit alternative woodland or forest such as Friston Forest, Crowborough Woods or Gravetye Woods; see **Figure 3.26**. Other heathland areas account

for only 0.8% of groups, perhaps indicating that there is little in the way of alternative heathland within easy access of visitors.

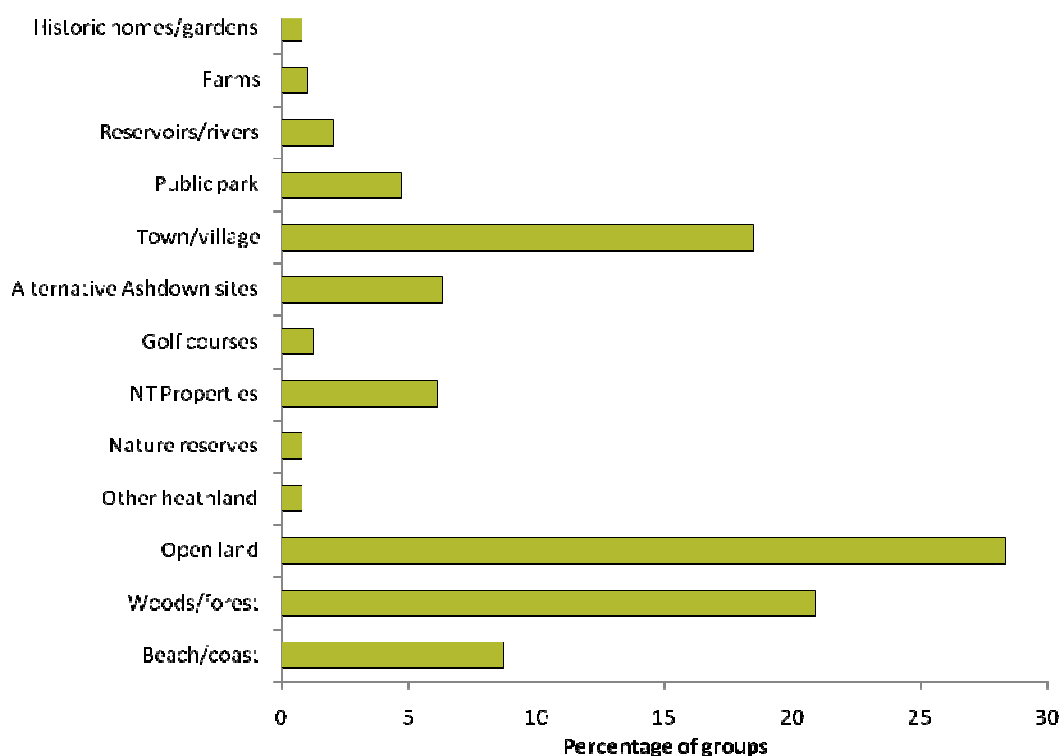


Figure 3.26: Percentage of groups visiting alternative sites, by site type

Table 3.20 and **Figure 3.27** depict the same dataset, but broken down by user type (dog-walkers and non-dog-walkers). This shows that 39.4% of dog-walkers visit alternative open land, as compared to 24.3% of other users, and 2.3% of dog-walkers visit alternative heathland sites in comparison with 0.3% of other users. However, fewer dog-walkers (16.7%) visit alternative woodland or forest sites than non-dog-walkers (22.4%).

Table 3.20: Percentage of groups visiting alternative sites, by site type and user type

Cat	Dog walkers			Non dog walkers		
	No of Groups	No of visitors	Total % of groups	No of Groups	No of visitors	Total % of groups
Beach/coast	33	56	9.1	10	18	7.6
Woods/forest	81	119	22.4	22	59	16.7
Open land	88	147	24.3	52	120	39.4
Other heathland	1	1	0.3	3	7	2.3
Nature reserves	3	3	0.8	1	2	0.8
NT Properties	14	20	3.9	16	47	12.1
Golf courses	6	8	1.7	0	0	0.0
Alternative Ashdown sites	29	36	8.0	2	9	1.5
Town/village	75	125	20.7	16	43	12.1

Cat	Dog walkers			Non dog walkers		
	No of Groups	No of visitors	Total % of groups	No of Groups	No of visitors	Total % of groups
Public park	18	26	5.0	5	10	3.8
Reservoirs/rivers	9	13	2.5	1	0	0.8
Farms	3	4	0.8	2	3	1.5
Historic homes/gardens	2	3	0.6	2	8	1.5
TOTAL	362	561	100	132	326	100

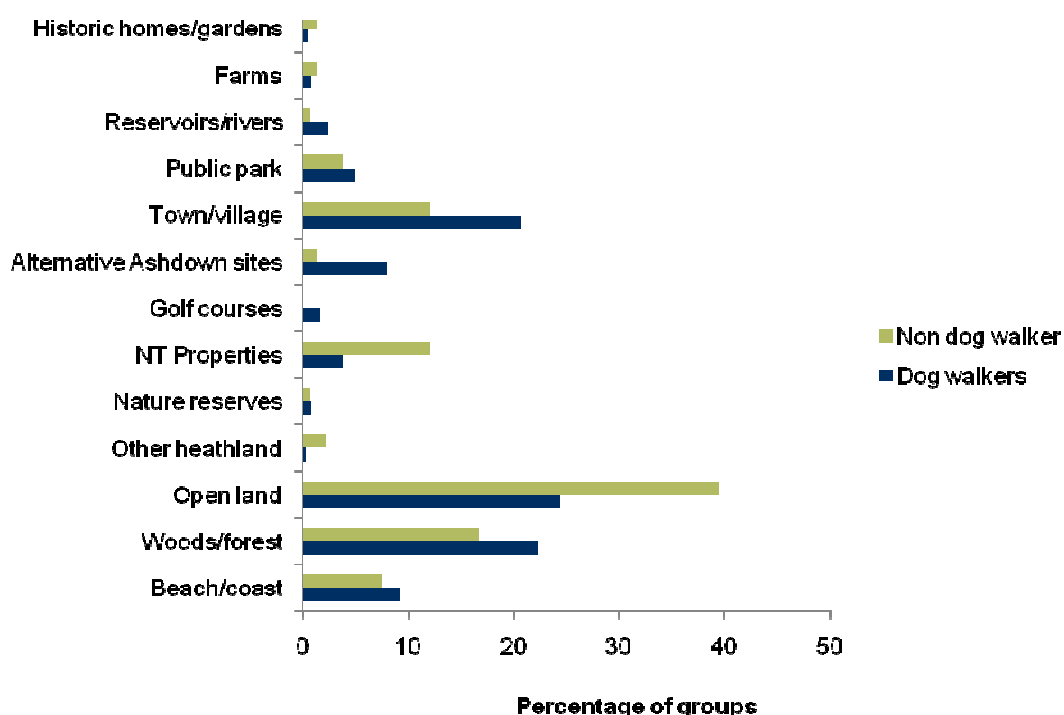


Figure 3.27: Percentage of groups visiting alternative sites, by site type and user type

Focusing in on visitors from Mid Sussex and Wealden districts, **Table 3.21** and **Figure 3.28** depict a subset of the same data. This shows that 36.8% of Mid Sussex residents and 21.3% of Wealden residents use other 'open land', while 12.6% and 23.4% go to other 'woods/forests' and 20.7% and 17.2% visit 'towns/villages', respectively. Only 5.7% of Mid Sussex residents and 9.0% of Wealden residents use other sites within Ashdown Forest.

Table 3.21: Percentage of groups visiting alternative sites, by site type and home district

Cat	Mid Sussex		Wealden	
	No. Groups	%	No. Groups	%
Beach/coast	10	11.5	26	10.7
Woods/forest	11	12.6	57	23.4
Open land	32	36.8	52	21.3

Cat	Mid Sussex		Wealden	
	No. Groups	%	No. Groups	%
Other heathland	1	1.1	1	0.4
Nature reserves	1	1.1	0	0.0
NT Properties	5	5.7	16	6.6
Golf courses	0	0.0	6	2.5
Alternative Ashdown sites	5	5.7	22	9.0
Town/village	18	20.7	42	17.2
Public park	1	1.1	11	4.5
Reservoirs/rivers	3	3.4	6	2.5
Farms	0	0.0	5	2.0
Historic homes/gardens	0	0.0	0	0.0
TOTAL	87	100.0	244	100.0

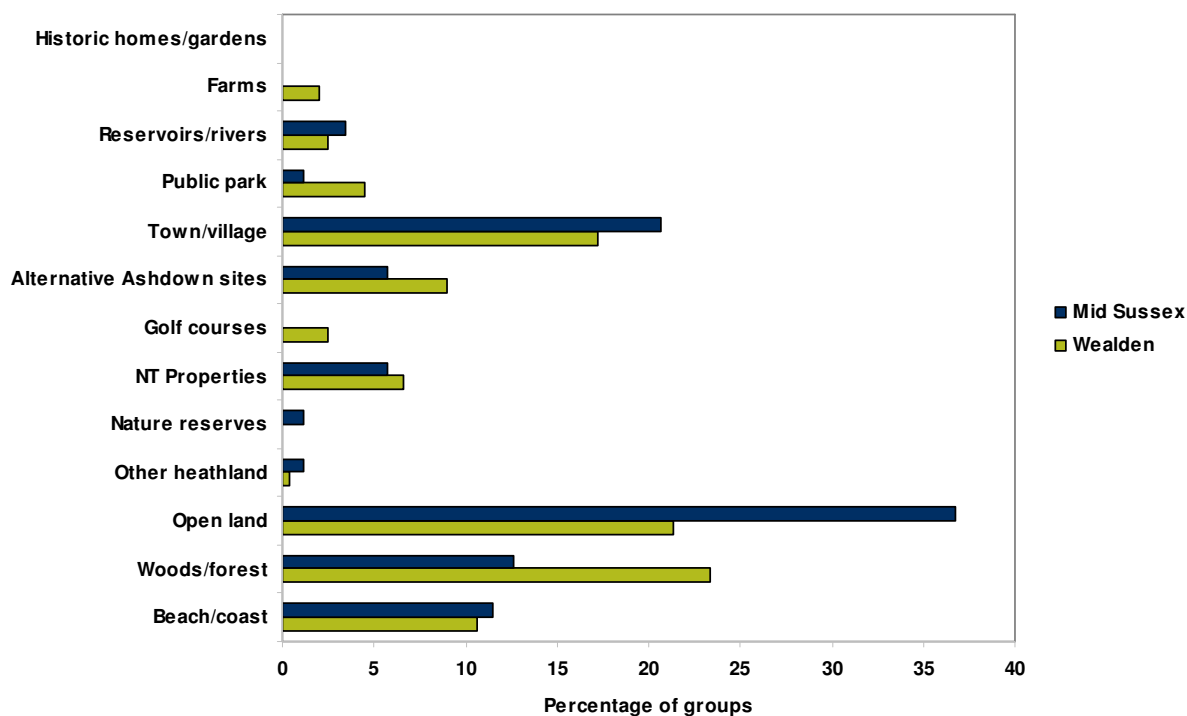


Figure 3.28: Percentage of groups visiting alternative sites, by site type and home district

3.2.19 Frequency of visiting alternative sites

In order to discover how often people travel to alternative sites, they were asked about their frequency of visits; 59% or 399 groups answered this question. Of those people that use alternative sites, 30.3% do so on a weekly basis, while 20.6% travel to different sites on a daily basis; 25.8% only visit other sites on a sporadic basis (see **Figure 3.29**). **Figure 3.30** compares the frequency of visits to other sites with the frequency of visits to Ashdown.

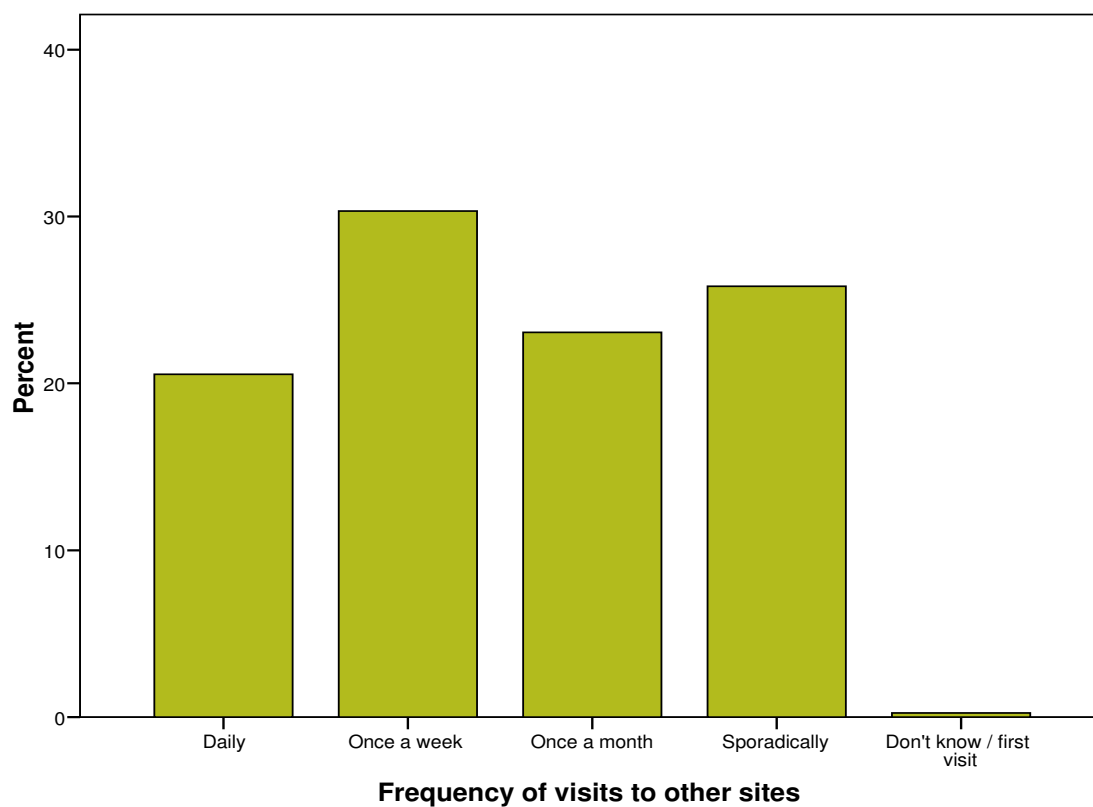


Figure 3.29: Frequency of visits to other sites by users of Ashdown Forest

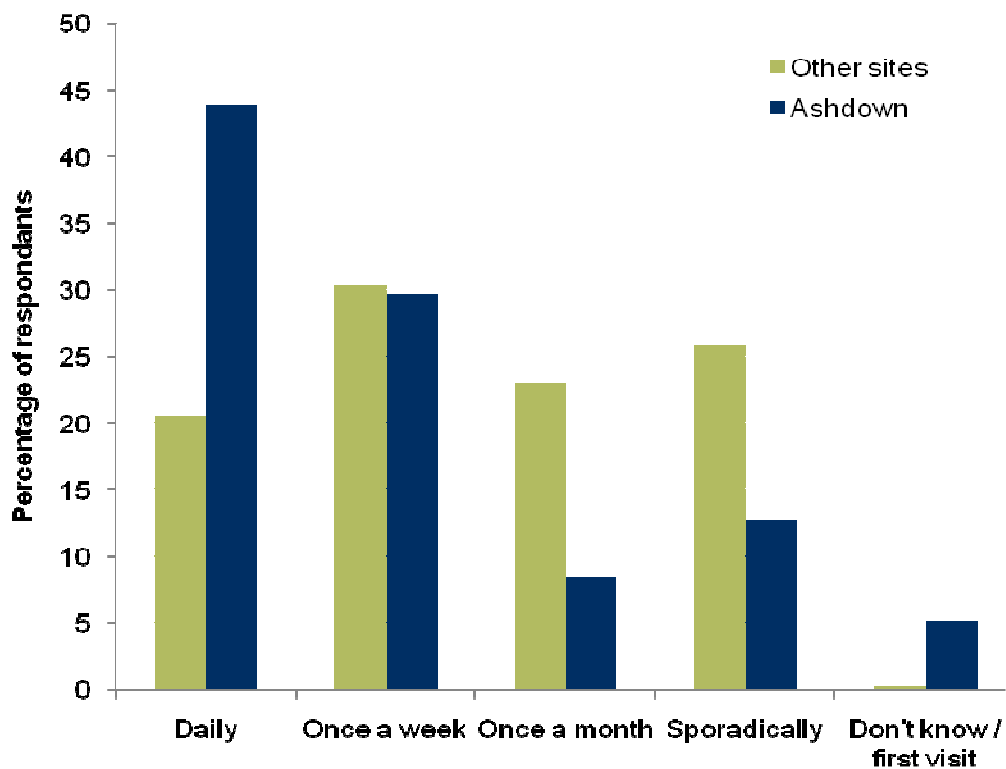


Figure 3.30: Frequency of visits to Ashdown Forest compared to other sites

3.2.20 Distance travelled and mode of transport to alternative sites

Of the people who answered the questionnaire, 61% (391 groups) said they would travel to places other than Ashdown Forest for recreational activities. These people were asked how far, on average, they would travel to reach an alternative site. Their answers are summarised in **Table 3.22**. Two types of user said they travelled different distances to alternative sites; 80.8% of people who stated walking as a primary reason for travelling to alternative sites were prepared to travel over 8km (5 miles) while only 45.6% of dog-walkers were prepared to travel a similar distance. Overall, a small number of people travelled less than 1.6km to alternative sites (13.3%) while over half of those people asked (53.9%) would travel over 8km (5 miles) to visit alternative sites.

Table 3.22: Distance travelled to alternative sites, by purpose

Activity	Total No groups	Percentage of groups		
		< 1 mile (<1.6km)	1 - 5 miles (1.6-8km)	> 5 miles (>8km)
Dog-walking	294	15.3	39.1	45.6
Walking	78	5.1	14.1	80.8
Running	2	50.0	0.0	50.0
Motorcycling	0	-	-	-
Bicycling	3	0.0	0.0	100.0
Horse riding	5	40.0	0.0	60.0
Picnic	2	0.0	0.0	100.0
Other	6	0.0	16.7	83.3
Total	391	13.3	32.5	53.9

People who said they used alternative sites were then asked how they travel to alternative sites (see **Table 3.23**). Of the people that cycle, 100% use a car to reach the alternative sites and those sites are over 8km (5 miles) from their home. For people who walk their dog as the primary reason for travel to alternative sites, the majority (84.6%) will travel over 1.6km (more than one mile). Only 15.3% of dog-walkers will travel to another local site. There is a significant correlation between distance travelled to alternative sites and distance travelled to the Forest (Spearman correlation = 0.167, p=0.001).

Table 3.23: Distance travelled to alternative sites, by purpose and mode of transport

Activity	Mode of Transport*	Total No groups	Percentage of groups		
			< 1 mile (<1.6km)	1 - 5 miles (1.6-8km)	> 5 miles (>8km)
Dog-walking	Motorised	274	15.3	40.1	44.5
	On foot	15	13.3	20.0	66.7
	Other	1	0.0	100.0	-

Activity	Mode of Transport*	Total No groups	Percentage of groups		
			< 1 mile (<1.6km)	1 - 5 miles (1.6-8km)	> 5 miles (>8km)
Walking	Motorised	73	5.5	13.7	80.8
	On foot	5	-	20.0	80.0
	Other	0	-	-	-
Running	Motorised	2	50.0	-	50.0
	On foot	0	-	-	-
	Other	0	-	-	-
Motorcycling	Motorised	0	-	-	-
	On foot	0	-	-	-
	Other	0	-	-	-
Bicycling	Motorised	2	-	-	100.0
	On foot	0	-	-	-
	Other	1	-	-	100.0
Horse riding	Motorised	0	-	-	-
	On foot	0	-	-	-
	Other	5	40.0	-	60.0
Picnic	Motorised	2	-	-	100.0
	On foot	0	-	-	-
	Other	0	-	-	-
Other	Motorised	6	-	16.7	83.3
	On foot	0	-	-	-
	Other	0	-	-	-
Total		386	13.2	32.6	54.1

3.2.21 Qualities and attractions of Ashdown Forest and its alternatives

In order to help understand the attractions of recreational space, and perhaps inform the design of alternative open space in areas other than the Forest, it is important to identify the qualities that draw people to Ashdown. Earlier research by Underhill-Day and Liley (2007) recommended that the likes and dislikes of visitors to heathland should be investigated in future work. Consequently, visitors to the Forest were asked what aspects they found particularly appealing about Ashdown that may not be available at other sites. The question was open-ended allowing people to provide as many or as few responses as desired. Overall 385 groups or 60.2% responded to the question, representing 68.2% of all visitors. Of these groups 50.4% gave one response, while 3.9% came up with four reasons why they like Ashdown (see **Table 3.24**).

Table 3.24: Attractiveness aspects of Ashdown Forest, by number of reasons given

No of reasons	Groups		Total No Visitors	
	Number	Percentage	Number	Percentage
One	194	50.4	378	51.9
Two	141	36.6	274	33.9
Three	35	9.1	69	9.5
Four	15	3.9	35	4.8
Total	385	100	729	100

As people could give more than one response to this question a total of 645 responses were recorded. The responses were assessed and categorised. The most common reason for visiting Ashdown Forest was the 'openness', stated by 28.0% of groups. A further 20.5% stated that the views were an important factor in choosing to visit Ashdown, followed by the 'natural beauty' (10.3%), 'ruralness' (6.8%), 'birds/wildlife' (5.3%) and water features (0.6%).

It is clear, therefore, that the physical environment is a significant factor in 71.0% of people's decision to visit the Forest (see **Figure 3.31**). The proximity to home was mentioned by 6.8% of people while the facilities such as car parks (3.2%), ice creams/cafes (1.8%), benches (1.1%), signage (0.6%) and Visitor Centre (0.3%) accounted for only 7.0% of the reasons why people visit Ashdown. 'Safety' (lots of people around) was mentioned by 1.5% of the respondents, while a 'dog friendly environment' and the availability of 'wildlife for dogs to chase' was mentioned by a combined 5.2% of people.

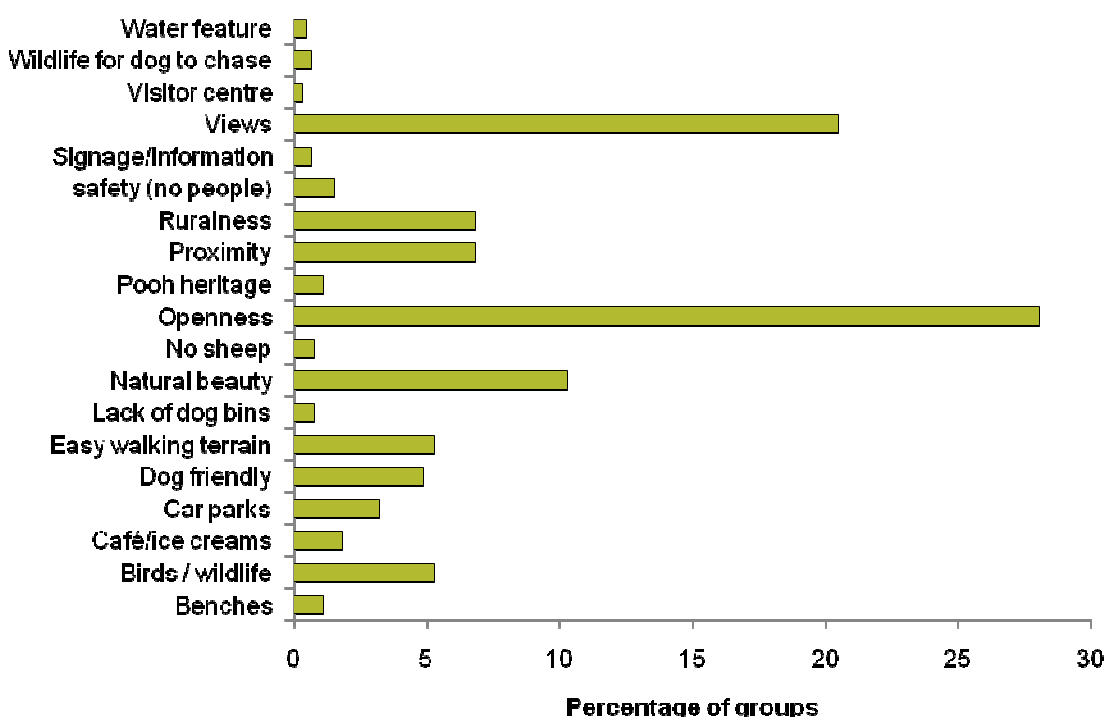


Figure 3.31: Respondents reasons for visiting Ashdown Forest

Examination of the data by user type (dog-walker and non-dog-walker) was also undertaken. For both groups of users, 'openness' and 'the view' were important aspects of attractiveness. Dog-walkers rated 'openness' higher than the views (30.0% and 19.8% respectively). The same pattern was true for non-dog-walkers, although the proportions were slightly different (22.4% and 22.5% respectively). Of non-dog-walkers, 17.1% mentioned the facilities and Pooh Heritage as attractive aspects of Ashdown Forest. The same categories were mentioned by only 5.1% of dog-walkers. Facilities such as 'dog friendliness', 'safety' and 'wildlife for dogs to chase' were mentioned by 9.1% of dog-walkers, while the same facilities were mentioned by only 0.6% of non-dog-walkers, as might be expected (see **Figure 3.32**).

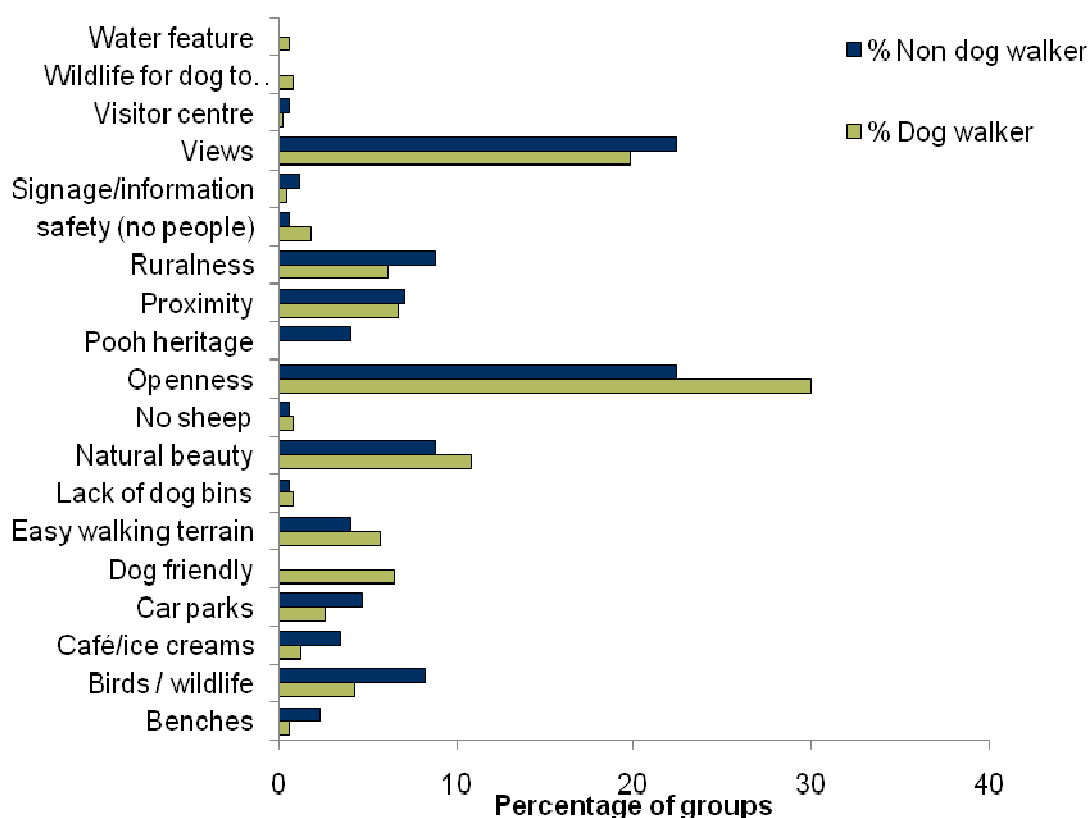


Figure 3.32: Comparison of attractiveness aspects by dog-walkers and non-dog-walkers

3.2.22 'Visitable area'

Similar studies of visitor access patterns at heathland sites in southern England (see Clarke *et al.* (2006) and Liley *et al.* (2006) for example) have examined the relationship between the 'visitable' area that an access point has to offer, and the number of visitors using the site. This type of analysis is considered less relevant to Ashdown Forest for two reasons.

Firstly, Ashdown Forest is a significant 'destination', that is, it is a well-known site that has more to offer than simply open space and recreation. The presence of Pooh Heritage, the Area of Outstanding Natural Beauty (AONB) and the Forest's history all contribute to this effect. Second, although the extent of heathland habitat within the Forest is rather fragmented in places, the Forest as a whole is generally viewed as a contiguous entity despite some parts being closed to the public due to private ownership and military uses.

Consequently, the 'visitable area' of Ashdown Forest is a considerable 2,470 hectares (which compares to the 3,207ha that are designated as SPA); see the map at **Appendix IX** which illustrates this. As a result there is little value in examining the correlation between the number of visitors to each access point and visitable area. Similarly, calculations regarding the total number of visitors will be applicable across the whole Forest rather than individual access points, although based on data recorded at the individual accesses.

3.2.23 Population density within fixed distances around the Forest

The results of population density analysis (as described in **section 2.8**) are set out in **Table 3.25**.

Table 3.25: Population densities at different distance bands from the Forest (Source: ONS, 2007, adjusted)

Distance band (m):	Population estimate within distance band	Cumulative population
0 - 200	270	270
201 - 400	413	683
401 - 600	442	1,125
601 - 800	482	1,607
801 - 1,000	543	2,150
1,001 - 1,500	1,961	4,111
1,501 - 2,000	2,002	6,113
2,001 - 3,000	5,618	11,731
3,001 - 4,000	1,172	12,903
4,001 - 5,000	8,109	21,012
5,001 - 7,500	12,089	33,101
7,501 - 10,000	23,765	56,866
10,001 - 12,500	49,591	106,457
12,501 - 15,000	63,177	169,634
TOTAL within 15,000m:	169,364	

3.2.24 Number of visitors from origins within fixed distance bands from the Forest

The number of groups visiting the Forest (from the surveys at every sample access point) originating from within each distance band has been calculated from the postcode data gathered during interviews (see also **section 2.7** and **Appendix X**). This is presented in **Table 3.26**, together with the total number of visitors (as opposed to groups) originating from each band.

The total number of groups (565) who gave a valid postcode or postcode stem represents 88.4% of the complete sample (639 groups); there were 74 missing/dirty records (11.6%). The

total number of people represented by these groups is 961, while the total number of people visiting the Forest from within each distance band is listed in the final column of Table 3.26.

Table 3.26: Visitor groups and numbers originating from within different distance bands, and total number of visitors within all groups in each band

Band	Visitor groups to SPA from within distance bands, based on:			Total people recorded per distance band
	a) Full postcode	b) Stem postcode	c) Total number of visitor grps (a+b)	
200	45	0	45	69
400	24	0	24	64
600	18	0	18	30
800	17	0	17	20
1,000	13	12	25	33
1,500	16	5	21	25
2,000	22	0	22	29
3,000	41	76	117	178
4,000	22	61	83	143
5,000	13	26	39	65
7,500	23	0	23	39
10,000	7	21	28	58
12,500	17	17	34	68
15,000	6	11	17	40
>15km:	31	21	52	100
Totals:	315	250	565	961

However, the information presented in the final column of Table 3.26 only gives a partial picture. The total number of people within a group that gave a postcode or postcode stem was 961 or 64.1% out of a total 1,499 recorded leaving all sites during the survey. Therefore, it might be assumed that the actual number of people originating from within each distance band who leave the Forest (as opposed to only those who were interviewed) would be 156.0% higher ($(n/64.1)*100$, giving a multiplier of 1.560).

Consequently, the figures listed in the final column of Table 3.26 need to be adjusted by a factor of 1.560 to give a more accurate representation. This is presented in Table 3.27, together with this number as an hourly rate of visitors. The hourly rate was calculated by taking the total adjusted visitor numbers and dividing by 320, the total number of hours spent surveying the Forest (20 sample sites, surveyed for eight two-hours periods each; $20*8*2=320$). This figure can then be multiplied by the number of daylight hours (presume

twelve) to give the estimated number of visitors to the Forest every day, by distance band; the final column of Table 3.27.

Table 3.27: Adjusted hourly and daily visitors to the Forest, by originating distance band

Band	Visitors (people) to SPA from within distance bands, based on:				Daily rate of visits per access point (multiplied by 12)	% of pop. in each distance band (T3.25)
	Visitors per band (from T3.26)	Adjustment factor (multiplier = 1.560)	Adjusted visitors per band	Hourly rate of visits (divided by 320)		
200	69	1.560	107.64	0.336	4.037	1.495
400	64	1.560	99.84	0.312	3.744	0.907
600	30	1.560	46.80	0.146	1.755	0.397
800	20	1.560	31.20	0.098	1.170	0.243
1,000	33	1.560	51.48	0.161	1.931	0.356
1,500	25	1.560	39.00	0.122	1.463	0.075
2,000	29	1.560	45.24	0.141	1.697	0.085
3,000	178	1.560	277.68	0.868	10.413	0.185
4,000	143	1.560	223.08	0.697	8.366	0.714
5,000	65	1.560	101.40	0.317	3.803	0.047
7,500	39	1.560	60.84	0.190	2.282	0.019
10,000	58	1.560	90.48	0.283	3.393	0.014
12,500	68	1.560	106.08	0.332	3.978	0.008
15,000	40	1.560	62.40	0.195	2.340	0.004
> 15km:	100	1.560	156.00	0.488	5.850	-
Totals:	961	-	1499.16	4.685	56.219	-

* Visits per person per day.

The data is also depicted in **Figure 3.33**. No further adjustments for high-, low- or shoulder-season are required because the data indicates that 81.3% of Ashdown Forest visitors do not vary their frequency of visit in accordance with the season (see **section 3.2.7**).

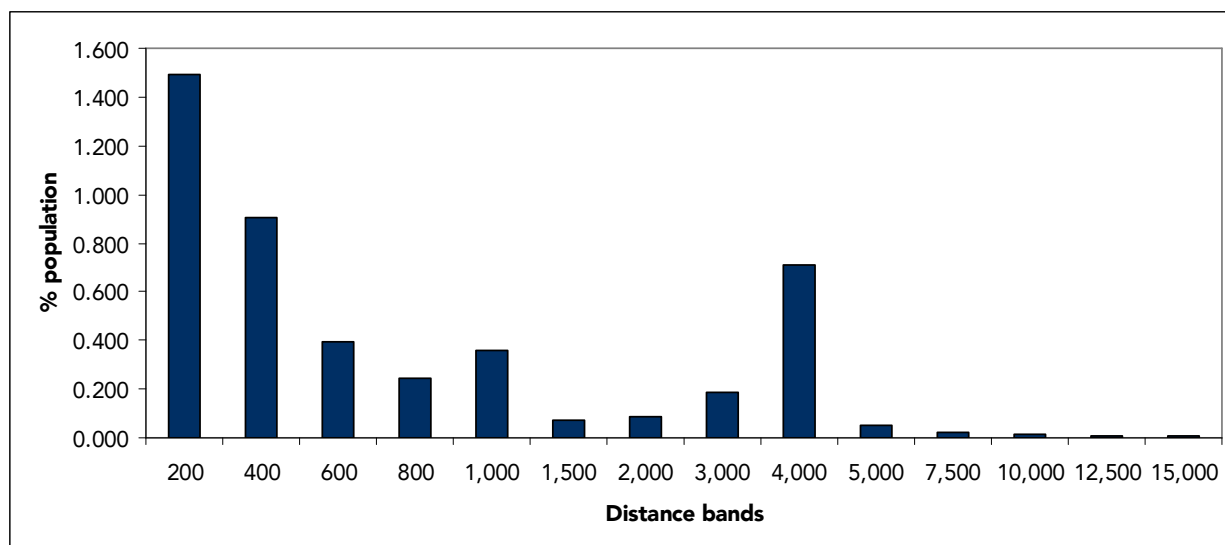


Figure 3.33: The decreasing percentage of population surrounding the Forest that visit; all users

3.3 Limitations

There are a number of limitations associated with the approach to the study. These are described in the following sections, which address project-specific limitations and the weather.

3.3.1 Limitations to project specification and approach

The main driver for carrying out the research was to inform a Habitats Regulations Assessment of the Mid Sussex Core Strategy, the timetable for which is driven in turn by the draft South East Plan and the Local Development Scheme as agreed with Government Office for the South East. Consequently, the scope of the survey (both the time period over which it was undertaken, and the number of access points and survey days included) was limited to an extent by the need to generate data to help shape the Core Strategy.

The ideal situation would have been to conduct surveys during the breeding bird season (March to July), at the height of the summer season (July) as well as the shoulder season (September) and beyond. In addition, the ideal would be to have two years of data as 2008 was a very wet summer overall and may have deterred non-locals from visiting the area (see below also). The likely outcome is **underestimation** of the total number of visitors; however, the survey has been designed to be replicable and could be repeated in 2009 or future years if required.

Furthermore, the timing of sampling periods over the day meant that all visitors may not have been captured. For example, people walking their dogs after the school run (for example between 9-10am) or using the Forest for after school activities (between 3-5pm) were not captured. Using pre-established time periods was an intended limitation, in order to allow comparisons to previous visitor surveys elsewhere. The implication is therefore that the survey may have **underestimated** total visitor numbers. Future surveys could follow a stratified sampling regime to ensure full capture of visitor activity.

The purpose of the study has been to establish the number of visitors to the Forest, their mode of transport, and activities undertaken while visiting, among other things. The scope did not attempt to establish whether or not the Forest had already reached its **carrying capacity** in relation to visitor numbers, or indeed what such a capacity might be. The survey does not, therefore, provide a statement as to whether the Forest is currently experiencing negative impacts over and above its ability to assimilate these without long-term damage (see **section 4.5** for more on this).

A key aspect of meeting the purpose of the study was to estimate **population densities** in areas surrounding the Forest. The method for this, as described in **section 2.9**, is challenging as it involved estimating the foot print (in hectares) of all urban areas (large and small settlements, and individual dwellings) within a 15km radius of the Forest, and then re-distributing ONS population data within the newly calculated hectarage. If inaccuracies exist this would directly affect predictions of additional visitor pressure; if there was an under estimate of adjusted population density the predicted additional visitor pressure would be an over estimate, and vice versa.

Finally, recording of the routes travelled whilst on the Forest was not always straightforward. Some visitors, particularly those less familiar to the Forest, found it difficult to identify the route they had just taken even with the help of maps and aerial photography. As a result, in some cases no route was plotted at all. In most cases, however, it was at least possible to determine an approximation of the route travelled. In addition, interviewers reported that there was a sense that people had probably travelled further while on the Forest than the route they drew suggested and, moreover, that the weather prevented them walking as far as they 'normally' did. Future surveys could include a 'time spent on the Forest' and 'your usual route' question to help fill these gaps.

3.3.2 *Unseasonal late-summer weather*

The weather posed something of a challenge. As described in **section 2.3**, particularly unsettled conditions prevailed as the survey was getting underway (see also **Appendix II**), which led to a later-than-planned start and may have suppressed the number of people visiting.

One possible result of the late start is that fewer visitors from beyond the local area might have been recorded than would otherwise have been the case had the survey been able to commence as planned. This is because the survey was designed to complete an equal number of sample days within the school holidays as within term-time, to present a balanced picture of visitor types (local users, tourists and day visitors, adults and children, etc). In fact, because of weather-related delays, three survey days (one weekday and two weekend days) were carried out during school holidays and five during term-time (three weekdays and two weekend days).

This may have led to a distortion in the extrapolation of the total number of visitors to the Forest each year, and indeed the source of visitor pressure at different times of year (summer holiday visitors as opposed to local users); the likely outcome is an **underestimation** of the total number of visitors.

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4 Discussion

4.1 Introduction

The data and analyses presented in **Chapter Three** provide extensive informative data regarding the patterns of visitor behaviour at Ashdown Forest. The data illustrates the key origins of visitors to the Forest, and can be used to help predict changes in visitor patterns as a result of increased population levels in the surrounding area, and inform visitor access management plans, as well as site management and restoration work. Each of these themes is explored in turn.

4.2 Key Origins of Visitors to Ashdown Forest

Pressure source maps depicting the distance bands from which the highest number of visitors originated during the study have been generated using GIS. These are shown in **Appendix XI**, where the data are given over three separate maps for: all users; pedestrians; and those travelling by motorised transport. These maps begin to illustrate the Forest's catchment area for locally-based users, and point to an interesting double-doughnut effect whereby, for both pedestrians and motor users, there seems to be two peaks of visitor pressure.

These peaks are at distance ranges 0 – 400m and 3 – 4km for pedestrians (both ranges contributing between 13 and 22 visitors over the survey period), and 3 – 5km (100+ visitors) and 7.5 – 12.5km (44 – 80 visitors) for motor users, and may be influenced by the existence of key settlements whose residents use the Forest on a regular basis within these ranges. The settlements are as follows.

0 – 400m:

- Wych Cross
- Forest Row
- Coleman's Hatch
- Friar's Gate
- C'borough Warren
- St John
- Poundgate
- Barnsden
- Nutley
- Fairwarp
- Horney Common
- Chelwood Gate
- Chelwood Common

3 – 4km:

- East Grinstead
- West Hoathly
- Horsted Keyes
- Fletching
- Uckfield
- Crowborough
- Buxted
- Hartfield

3 – 5km:

- As 3-4km, plus:
- Danehill

7.5 – 12.5km:

- Crawley
- Tunbridge Wells
- Mayfield
- Heathfield
- Isfield
- North Chailey
- Haywards Heath
- Balcombe

The total number of visitors to the Forest originating from within Mid Sussex (based on postcode and postcode-stem data only) is **145** (9.7% of the total recorded), and **587** (39.2%) from within Wealden.

4.3 Toward a Predictive Model for Estimating Additional Visitor Pressure at Ashdown Forest

4.3.1 Relevant data

A central driver for undertaking the study was the need to establish the number of visitors to the Forest originating from within Mid Sussex and Wealden districts, and that number as a proportion of the total number of visitors (**section 4.2**). The data collected allows a more in-depth analysis than this, and by examining numbers of visitors to the Forest by postcode (**section 3.2.11**), the total number of visitors observed (**section 3.2.1**), the population density of surrounding areas (**section 3.2.23**) and typicality of sampled access points (**section 2.2**), it is possible to work up a rudimentary predictive model for the effects of demographic changes in adjacent areas.

4.3.2 Extrapolating visitor numbers to give annual totals

So how can we use this data to establish the total number of visitors to the Forest? Liley *et al.* (2006) used a simple calculation based on the estimated hourly rate of visitors and number of access points. A similar calculation here works as follows (see also **section 4.7**):

▶ Total number of people recorded leaving the Forest:	1,499
▶ Number of access points surveyed:	20
▶ Mean number of people leaving per access:	74.95
▶ Number of hours surveying per access:	16
▶ Mean number of people leaving per access per hour:	4.68
▶ Daylight hours per day (assume 0700-1900):	12
▶ Total people leaving per access per day:	56.21
▶ Mean number of people leaving per access per year:	20,530.70
▶ Total number of access points ^v :	66
▶ Estimated total annual visits to Ashdown Forest:	1,355,026

4.3.3 Predicting additional visitor pressure as a result of increased population density

And how can the data be analysed to give an indication of changes in visitor pressure as a result of demographic change? Having established the hourly rate of visitors to the Dorset Heathlands, Clarke *et al.* (2003) devised a calculation to predict the number of additional visitors created by a new housing development. A similar model is demonstrated below, and is presented with the following caveats.

^v The total number of access points onto the Forest has been estimated by the Conservators of Ashdown Forest (Chris Marrable (Conservation Officer), Pers. comm. (2008b) as 48 car parks plus 18 recognisable pedestrian accesses.

First, the model presented is just that; a model. There are several different ways in which the field data could be analysed and here just one method is explored. Second, the residents occupying a theoretical new development would clearly not visit the Forest in a uniform fashion. Indeed, for some residents a visit to the Forest would be dependent on other residents of the same household. For example children living at a distance of greater than a kilometre or two are likely to need a lift from a parent.

Third, across all UK households around 23% own a dog (PFMA, 2009) whereas the findings of the present study suggest that this is the main reason for visiting the Forest (60.0% of all visits). Of the households that do own a dog, many will go to alternative locations more convenient to their daily routine, and the proportion visiting other sites is likely to increase with distance from the Forest. Finally, while all 66 access points to the Forest remain open year-round, eight (out of 48; see **Appendix XII**) car parks close for the winter months. This is likely to enhance seasonal variation in the numbers visiting, especially during winter, and particularly for those travelling from further away who are more likely to visit by car.

Nonetheless, a predictive model can offer an insight to the level of change in visitor pressure that might be expected as a result of certain development scenarios. Based on an estimated average dwelling occupancy rate of 2.36 people per house (ONS, 2001) and the data described in **section 3.2.24**, an example of the model for a theoretical 500 unit housing development 300m from the Forest works as follows:

- ▶ 500 homes would house 1,180 people
- ▶ From Table 3.27, 0.907% of the population living within 200-400m from the Forest visit each day: $1,180 \times 0.907\% = 10.697$ people
- ▶ Therefore a total of 10.697 additional visitors to the Forest would be expected at each access point every day, as a result of such a housing development, or 3,907.131 additional visitors per access point per year
- ▶ Across all 66 Forest access points, this equates to a total annual increase of visitor pressure equivalent to **257,871 visits**

Similarly, a housing development of 1,500 homes at a distance of 4.5km from the Forest would be expected to generate additional visitors as follows:

- ▶ 1,500 homes would house 3,540 people
- ▶ From Table 3.27, 0.047% of the population living within 4-5km from the Forest visit each day: $3,540 \times 0.047\% = 1.664$ people
- ▶ Therefore a total of 1.664 additional visitors to the Forest would be expected at each access point every day, as a result of such a housing development, or 607.703 additional visitors per access point per year
- ▶ Across all 66 Forest access points, this equates to a total annual increase of visitor pressure equivalent to **40,108 visits**

And, development of 3,000 homes at a distance of 9.5km from the Forest would be expected to generate additional visitors as follows:

- ▶ 3,000 homes would house 7,080 people
- ▶ From Table 3.27, 0.014% of the population living within 9.5km from the Forest visit each day: $7,080 \times 0.014\% = 1.011$ people
- ▶ Therefore a total of 1.011 additional visitors to the Forest would be expected at each access point every day, as a result of such a housing development, or 369.207 additional visitors per access point per year
- ▶ Across all 66 Forest access points, this equates to a total annual increase of visitor pressure equivalent to **24,368 visits**

4.4 Considerations for the Provision of Alternative Sites

As part of the planning process for possible future development scenarios, it may become necessary to consider providing alternative recreational areas to deflect some of the pressure away from Ashdown Forest and help maintain the SPA's conservation objectives. **Sections 3.2.18 – 3.2.21** provide comparator data between usage patterns at Ashdown, and at other sites questionnaire respondents said they visit. Of the 399 groups that answered these questions, 50.9% use alternative sites for the same purpose on at least a daily or weekly basis, with a further 23.1% using them on a monthly basis.

Among walkers, 80.8% are prepared to travel 8km or more to reach alternative sites on a regular basis, while 45.6% of dog-walkers will travel a similar distance. Only 13.3% of people travel less than 1.6km, perhaps reflecting a lack of suitable alternatives in their local area.

As stated in **section 3.2.21**, the most common reason for visiting Ashdown Forest was the 'openness', stated by 28.0% of groups. A further 20.5% stated that the views were an important factor in choosing to visit Ashdown, followed by the 'natural beauty' (10.3%), 'ruralness' (6.8%), 'birds/wildlife' (5.3%) and water features (0.6%). The proximity to home was mentioned by 6.8% of people.

Examination of the data by user type (dog-walker and non-dog-walker) was also undertaken. For both groups of users, 'openness' and 'the view' were important aspects of attractiveness. Dog-walkers rated 'openness' higher than the views (30.0% and 19.8% respectively). The same pattern was true for non-dog-walkers, although the proportions were slightly different (22.4% and 22.5% respectively). Facilities such as 'dog friendliness', 'safety' and 'wildlife for dogs to chase' were mentioned by 9.1% of dog-walkers, while the same facilities were mentioned by only 0.6% of non-dog-walkers.

In order to deliver alternative space that successfully draws visitors who might otherwise go to Ashdown therefore, sites should be investigated that can fulfil the following criteria:

- ▶ Proximity to new and existing development;
- ▶ Feasibility to recreate a sense of the wide open countryside;

- ▶ The presence of attractive views;
- ▶ Nature conservation interest to provide the opportunity for people to feel in touch with the natural world, and which could include nature trails and other forms of interpretation;
- ▶ A sense of security, particularly for dog-walkers who are most likely to visit alone and at either extremity of the day; and
- ▶ Accessibility and ample parking.

Any site that has the additional ability to intercept existing visitors to Ashdown because it is situated closer to the users' homes, would have further value in this respect.

4.5 Possible Changes to Site Management

Sections 3.2.12 – 3.2.14 describe how far people venture onto the Forest once there, as well as whether or not they leave the main tracks and whether dog-walkers let their dogs off the lead. The routes people travel from their access point have been mapped, and these have subsequently been overlaid with known existing Dartford warbler and nightjar territories and habitat types (**Appendices VII and VIII**).

Although the overlay with bird territories does not show any discernable negative relationship between routes travelled and territory location at the Forest-wide scale, a larger visitor dataset mapped across a series of smaller areas might do. Moreover, the current overlay maps appear to indicate a *positive* relationship between routes travelled and bird territories; this would seem to suggest that the current level of visitor pressure is not causing birds to displace to other parts of the Forest, which in turn implies that the current level of disturbance is not causing negative effects on the SPA features. This position is also tentatively supported by the bird population trend comparison provided in **section 1.3**, where available data suggest that Ashdown bird population sizes are growing at a comparable rate to the UK population. However, it must be noted that both species have declined locally in recent years (2001-05) where there is no national data to offer a comparison. The logical conclusion is that, while the populations of both species are fulfilling their conservation objectives, significant risks to population stability remain which require ongoing monitoring and management of the Forest and its visitors.

As already mentioned, Murison *et al.* (2007) found that habitat structure significantly correlated with breeding success in Dartford warbler, in that bird territories in areas dominated by European gorse tended to fare better than those dominated by heather. Furthermore, they observed that while dogs off the lead would range up to 45m off the track in heather dominated territories, they seldom left the path at all in areas dominated by gorse.

Changes to site management that could be considered in order to reduce the impacts associated with increased visitor pressure should therefore include:

- ▶ Strategic planting of gorse species (especially European gorse), particularly along tracksides and to help screen-off restricted access areas;

- ▶ Further developing the use of zoned visitor management whereby certain parts of the Forest are designated as appropriate for particular activities (including exercise opportunities for people and dogs), while other areas are designated as wilderness or nature conservation areas;
- ▶ Decreased parking capacity across the Forest, to limit the numbers visiting;
- ▶ Decreased parking capacity on a zoned-management basis, whereby users are encouraged to visit less sensitive parts of the Forest, allowing other parts to be closed-off or restricted. This could be usefully supplemented by the provision of additional visitor facilities such as WCs or a café;
- ▶ Use of car park charging to further influence visitor behaviour, although the results of this study suggest that the majority of users (56.7%) are willing to pay for parking in any event, so long as the funds are put towards the management of the Forest; and
- ▶ Increased wardening activity (notwithstanding the excellent work already carried out by the Conservators) to clamp down on visitors not abiding by the general ban on dogs without a lead during the breeding bird season (as set out in the Countryside and Rights of Way Act 2000).

4.6 Comparison with Earlier Surveys of Ashdown Forest

A visitor monitoring survey was carried out in 2004 by Tourism South East on behalf of Wealden District Council and the Ashdown Forest Tourism Forum (Wealden DC *et al.*, 2004). Although the survey was undertaken to fulfil different objectives to this study, and used an alternative methodology, a comparison of key findings will help to frame some of the implications of the current survey.

In the 2004 survey, 19% of respondents identified themselves as locally-based visitors, while 72% came from outside the local area. The definition of locally-based is quite specific in the 2004 study, encompassing those living within the Forest as well as Chelwood Gate, Coleman's Hatch, Crowborough, Fairwarp, Forest Row, Hartfield, Herons Gill, Maresfield, Nutley and Withyham. We purposefully do not attempt a definition of local-user in the current study, but the implications of the data presented in **Chapter Three** suggest that the majority of respondents could be classified as locally-based; 73.3% of people interviewed visit at least once a day or week, and around 95% of visitors came from within 13km of the Forest. In broad comparison, such variation between the two surveys would seem to reinforce the argument that unfavourable weather conditions and the resulting late start to the survey period (see **section 3.3**) may have resulted in an under estimate of the numbers visiting the Forest, particularly those coming from beyond the local area.

The 2004 survey states that the primary purpose for visiting was going for a walk (29%), followed by Pooh heritage (18%), walking the dog (17%), sightseeing from the car (13%), or enjoying the views and having a picnic (13%). The results of the current study (**section 3.2.9**) state that dog-walking was much more prevalent as the primary purpose (60%), followed by going for a walk (30%) and having a picnic (2%). No single other category of purpose registered more than 1% of responses, although quite a variety of qualities and attractions

were quoted as part of the decision to come to Ashdown rather than an alternative site (**section 3.2.21**). Combined with the relative use of motorised transport to reach the Forest (98% in 2004, 87% in 2008), these stated primary purposes would again seem to suggest that the majority of the 2008 sample could be classified as local.

The aspects or qualities the visitors particularly like about the Forest were broadly comparable. Those quoted in 2004 included peace and quiet (36%), views and scenery (34%), open spaces (25%), the unspoilt nature of the Forest (11%) and the wildlife (7%). In 2008, similar characteristics were quoted as follows: 'openness' (28%), the views (20%), natural beauty (10%), 'ruralness' (7%), and 'birds/wildlife' (5%). In 2004, 32% were in favour of voluntary charging at car parks, while in 2008 57% expressed a willingness to pay for car parks with 23% of those answering the question preferring a voluntary donation to a fixed fee.

In 2004, the average group size at Poohsticks Bridge car park was 2.9 persons, with 9.5% of groups being accompanied by one or more dogs, while at Friends car park the average group size was 2.3, with 33% of groups being accompanied by one or more dogs. In 2008, 55.9% of groups interviewed were lone individuals, 33.2% were in pairs, and 9.7% in groups of three to five. Just over half the groups had one dog with them, while a further 20.8% had two dogs with them; only 22.2% of groups interviewed were not accompanied by a dog. There was an average of 0.68 dogs per person.

4.7 Underestimation and Comparison with Car Park Vehicle Counter Data

The Conservators of Ashdown Forest have an interest in monitoring the number of people making use of the Forest, and the facilities they provide. As a result, they have embarked on a limited programme of monitoring at the entrance/exit of certain car parks, using automated vehicle counters. This method comes with its own implicit limitations, not least uncertainty surrounding the number of people (or dogs) within each vehicle, and whether or not they exited their vehicle and spent any time on the Forest. It also excludes any visitors arriving by foot, cycle, horse or other mode.

Nevertheless, a comparison of the predictions made in **section 4.3** with car park counter data and local knowledge will help to frame the findings of this study. Two car park counters were deployed in May 2007, one at each entrance of the Broadstone car park. On the basis of data collected from these counters, it was clear that the east entrance to the car park was recording 56.3% of all visits to Broadstone. During February 2008 the counter at the west entrance was moved to the Ashdown Forest Centre to monitor activity there. The comparison presented in the following paragraphs focuses on the data from counts at the east entrance to Broadstone because no visitor surveys were undertaken at the Forest Centre during this study.

Table 4.1 describes data from the Broadstone east vehicle counter between May 2007 and December 2008, and shows that 47,958 vehicle movements were counted. The data is adjusted to account for it recording only 56.3% of movements (divide by 56.3, multiply by 100). To avoid double counting, it is further adjusted to account for vehicles both arriving at and departing from Broadstone (divide by two); every vehicle arriving would be expected also to leave the same day with all its passengers. The total number of vehicle visits is therefore

42,591 over 582 days. The number of people visiting per day is then extrapolated by dividing 42,591 by 582, and multiplying by the average group size of people travelling to the Forest by car during this survey (1.7 persons – see Table 3.9): 124.4 people per day.

Table 4.1: Automated vehicle counter data, 2007 and 2008 (Broadstone east entrance)

Adjustment	Calculation	Broadstone car park
Period	-	21 May 2007 to 22 Dec 2008 (582 days)
No. vehicle movements	-	47,958
Add 2 nd entrance	(/56.3)*100	85,183
Total vehicles visits	(/2)	42,591
Vehicles per day	(/582)	73.2
Passengers per day	*1.7	124.4
Vehicles per year	(*365.25)	26,736
Passengers per year	(*365.25)	45,440

Pers. comm. (2008a)

During the present study, over eight two-hour periods, 104 people were counted leaving Broadstone car park, or 52 per day. This illustrates that, at Broadstone car park at least, the number of people visiting according to automated vehicle counters is approximately **2.4 times higher** than the number of people counted during a similar period by the interviewers, leading to a possible underestimation of total visitor numbers. Conversely, while some of the limitations of automated counters are addressed by the adjustments made in the previous paragraph, they do not help to determine what proportion of visitors recorded by the automated counters did not exit their vehicle to spend time on the Forest.

Such underestimation is likely to be the combined result of the time of year the study was carried out, poor weather conditions, and possibly the two-hour sampling periods chosen (see also **section 3.3**). The approach and methodology of this survey are nonetheless believed to be appropriate, and the data accurate within the confines of the study. Disparities between automated vehicles counters and manual head counts serve to further highlight the importance of ongoing monitoring of visitor numbers and patterns on Ashdown Forest.

It is possible to re-calculate the estimated total annual visitors to Ashdown Forest bearing this apparent underestimate in mind, by taking the total number of people recorded leaving car park access points and factoring this upwards by a multiplier of 2.4. The number of people leaving pedestrian access points should not be altered because there is no comparable data from which to derive a multiplier, and it should again be noted that this method neither takes into account any visitors who did not leave their vehicles to visit the Forest, nor the number of car parks that are closed during autumn and winter.

Using this method, a revised calculation of the estimate given in **section 4.3.2** would work as follows:

▶ Total number of people recorded leaving pedestrian access points:	251
▶ Adjusted number of people recorded leaving car park accesses (*2.4):	2,973
▶ Total number of people recorded leaving the Forest, adjusted:	3,224
▶ Number of access points surveyed:	20
▶ Mean number of people leaving per access:	161.200
▶ Number of hours surveying per access:	16
▶ Mean number of people leaving per access per hour:	10.075
▶ Daylight hours per day (assume 0700-1900):	12
▶ Total people leaving per access per day:	120.900
▶ Mean number of people leaving per access per year:	44,158.725
▶ Total number of access points:	66
▶ Estimated total annual visits to Ashdown Forest:	2,914,476

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5 Conclusions and Further Research

5.1 Summary

This report has set out the findings of a study into visitor access patterns at the Ashdown Forest SPA. The survey was carried out during summer and autumn 2008 and generated data resulting from 639 completed interviews.

The findings confirm that the Forest is a much visited destination with a local (as opposed to tourist) **catchment area of around 13km**. Annual visits to the Forest are estimated at around **1.35 million**, with the majority of people (60.0%) visiting for the primary purpose of dog-walking. However, unusually inclement weather conditions during the survey are expected to have led to an underestimate of total visitor numbers. A brief comparison made with automated vehicle counter data from one car park (Broadstone) suggests that the actual number of annual visitors could be **up to 2.4 times higher** at some car parks, but this may not be the case across all car parks.

Extensive informative data has been gathered which will help to improve the provision of alternative recreational sites, and refine visitor access management and habitat management at Ashdown.

In addition, a predictive model is presented to assist in determining strategic planning priorities and the location of new housing development. For example, it is shown that a theoretical housing development of 500 homes 300m from the Forest could generate an additional **257,871 visits** per year, although again this is likely to be an underestimate.

The total number of visitors to the Forest originating from within Mid Sussex during this study (based on postcode and postcode-stem data only) is calculated as **145** (9.7% of the total recorded), together with **587** (39.2%) from within Wealden. The study hypothesis that the number of Mid Sussex and Wealden residents travelling to the Forest, as a proportion of the total number, will decrease as the distance of their origin from the Forest increases has been borne out by the data collected.

5.2 Opportunities for Further Research

The scope of the study to investigate ideas that were not aligned with its main objectives was limited by both timescale and budget. Nonetheless, a number of opportunities for further research present themselves, the foci of which should be on informing future access management and greenspace strategies. These include:

- ▶ Additional analysis to further investigate any correlation between dogs on and off the lead, and distribution of bird territories. This could also be examined by individual access point;

- ▶ Analysis to investigate any correlation between dogs on and off the track, and distribution of bird territories. This could also be examined by access point;
- ▶ An extension of the study to analyse visitor patterns during the peak summer period (July and August), to compare to the shoulder season when this survey was conducted (September), and to incorporate greater use of automated vehicle counters to give a more accurate representation of total visitor numbers;
- ▶ An extension of the study to analyse visitor patterns during the winter months, in terms of the volume and behaviour visitors, their origin, and specific impacts on bird populations during a period of additional environmental pressure (food availability, harsher weather conditions, and so on);
- ▶ Analysis and mapping to further understand the relationship between land ownership and management practices, and the incidence of areas of greatest nature conservation importance as opposed to recreational value;
- ▶ Further analysis to gain more accurate estimates of population densities in areas surrounding Ashdown Forest;
- ▶ Further study to examine the relationship between the capacity of the Forest's ability to support recreational visitors, and the number of people visiting;
- ▶ Incorporation of focus groups into future surveys, to help better understand the motivation, purpose and patterns of activity of non-standard users (such as runners, riders, cyclists and youth groups) within the Forest;
- ▶ Further develop the questionnaire to better understand the relationship of Ashdown Forest to alternative recreational sites, in terms of what alternative sites have to offer and the types of activities that are undertaken; and
- ▶ Design an additional study to investigate the impact of dog excrement on the habitats supporting the Dartford warbler and nightjar.

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Appendix I: Survey Site Locations

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Appendix II: Weather Record

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Appendix III: Field Questionnaire

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Appendix IV: Ashdown Forest Distance Band Ranges and Population Density

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Appendix V: Visitor Origins by Postcode Data

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Appendix VI: Extent of Heathland Habitat and Breeding Bird Territories

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Appendix VII: Route Maps overlaid with Breeding Bird Territories and Habitats (no base map)

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Appendix VIII: Route Maps overlaid with Breeding Bird Territories and Habitats (with base map)

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Appendix IX: Ashdown Forest 'Visitable Area'

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Appendix X: Unique Postcode Locations and Distance Bands

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Appendix XI: Recreational Pressure Source Maps

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Appendix XII: Total Car Park Dataset

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