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Visitor Survey Results from Breckland SPA

Fearnley, H., Liley, D. & Cruickshanks, K.

Forest Office
Cold Harbour
Wareham
Dorset BH20 7PA
Tel/Fax: 01929 552444
info@footprint-ecology.co.uk

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www.footprint-ecology.co.uk

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Summary

This reports sets out the results of an on-site visitor survey of Breckland SPA. The work was commissioned by Forest Heath District and St. Edmundsbury Borough Councils to explore the consequences of development on Annex 1 bird species associated with Breckland SPA.

The visitor monitoring was conducted during early summer 2010 (outside of the school holidays) to assess the current level and type of visitor use across the SPA by local residents. Counts of people and visitor interviews were conducted at 16 different locations involving 176 hours of survey work, split equally between weekdays and weekends. A total of 279 interviews were undertaken accounting for 677 people and 200 dogs. The average group size was 2.3 people.

There were differences in visitor numbers between survey locations with the highest number of visitors interviewed at Brandon Country Park. Visitor numbers were typically highest on weekends compared to weekdays and holiday makers accounted for 9% of the total number of visitors interviewed.

Visitors undertook a wide range of different activities with 76% of all interviewees either dog walking, walking or cycling. The overwhelming majority of visitors to Breckalnd SPA arrived by car and half of all interviewed visitors who arrived by car lived within 9.5km of the survey location where they were interviewed. Only 8% of visitors arrived by foot.

Five driving transects covering 253 car parks with 2008 spaces were also undertaken. These also showed that the number of parked cars recording on weekend days was greater than number recorded on weekdays. On average only 10% of the available car parking spaces were occupied.

Contents

Acknowledgements

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1 Introduction

Overview

1.1 This report has been commissioned by St. Edmundsbury and Forest Heath Councils to consider the implications of recreation relating to new development within these two districts for the Breckland Special Protection Area (SPA). In particular we focus on the links between housing development, recreational access and disturbance to the Annex I bird species that are an interest feature of the SPA, and then how this relates to legislative duties placed upon the Councils in terms of the conservation of Habitats and Species Regulations 2010, the 'Habitats Regulations.'.

1.2 Our approach is to consider the evidence base relating to urban impacts, recreational disturbance and the bird interest of the SPA. We then present the results of visitor survey work, undertaken to inform this report, within the SPA, and we use these results to understand the impacts of new development in terms of increased recreational access and potential adverse effects on the SPA.

Breckland SPA

1.3 The Breckland SPA straddles the Norfolk and Suffolk border, lying at the heart of East Anglia on largely sandy soils of glacial origin. The continental climate, with low rainfall and free-draining soils, has led to the development of dry heath and grassland communities. Much of Breckland was planted with conifers through the 20th century, and elsewhere arable farming is the predominant land use. This site qualifies under Article 4.1 of the Birds Directive (79/409/EEC) by supporting populations of European importance of three species listed on Annex I of the Directive: woodlark *Lullula arborea,* nightjar *Caprimulgus europaeus* and stone curlew *Burhinus oedicnemus.* Nightjar and woodlark are both species associated predominantly with heathland and clearfell areas within the commercial conifer plantations. Stone curlews largely occur on arable and grass heath habitats.

1.4 The SPA review account[1] gives the population of the three species as:

- Nightjar: 415 pairs representing up to 12.2% of the breeding population in Great Britain (data from 1998)
- Stone Curlew: 142 pairs representing up to 74.7% of the breeding population in Great Britain (data from 1998)
- Woodlark: 430 pairs representing up to 28.7% of the breeding population in Great Britain (data from 1997)

1.5 All three species are ground nesting and breed within Breckland. Nightjars are summer migrants, arriving in late April/May and nesting from early May through

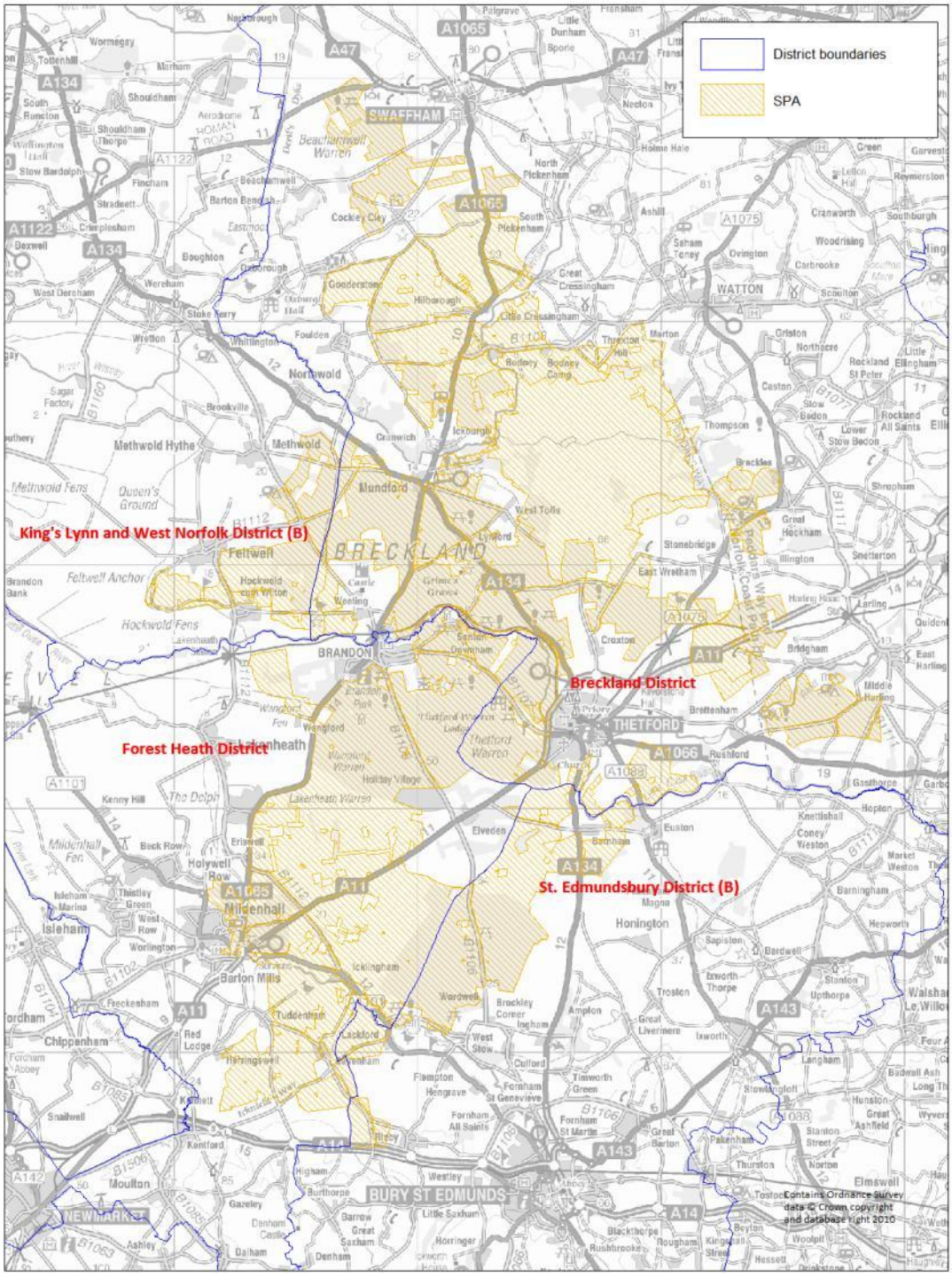
[1] http://www.jncc.gov.uk/default.aspx?page=2016

until August. Stone curlews are also summer migrants, arriving in March, and nesting from April through to July. Woodlarks are partial migrants, sometimes wintering locally or at least within the UK and they tend to arrive on breeding sites from late January/February. Breeding occurs from March and finishes in July. The breeding ecology and status of the three species within the Brecks is well documented (Bowden & Hoblyn 1990; Bowden 1990a, b; Bowden & Green 1991; Green, Tyler, & Bowden 2000; Day 2003; Conway et al. 2007, 2009; Langston, Wotton, et al. 2007; Wright et al. 2007, 2009; Sharp et al. 2008; Bright et al. 2010; Dolman 2010).

1.6 The SPA contains a range of habitats, including commercial conifer blocks, lowland dry heath, grass heath and arable land. The heathland elements are also features of the Breckland Special Area of Conservation (SAC).

1.7 The SPA is shown in Map 1 in relation to Forest Heath and St. Edmundsbury Borough. The SPA covers 39433.7Ha, of which 29% (11,527.4Ha) is within the Forest Heath District and 9.6% (3799.6 Ha) is in the District of St. Edmundsbury.

Map 1: Breckland SPA and district boundaries



Implications of new development surrounding the SPA

1.8 New housing can result in an increase in the pressure on heathland sites through a wide range of impacts including: increased access, increased incidence of deliberate and accidental fires, litter, predation from people and pets, eutrophication and dumping/fly tipping. Attention was formally drawn to these issues in a report on the Dorset heaths to the Council of Europe in 1998 (De Molinaar 1998), which prompted the UK Government to commission a study of heathland fires in that county (Kirby & Tantram 1999). Various authors have since reviewed and summarised urban impacts to heathlands (Haskins 2000; Underhill-Day 2005; Liley, Clarke, Underhill-Day, et al. 2006); we provide a summary in Table 1. We view these urban effects as potentially operating synergistically to influence the conservation interest of sites surrounded by high densities of housing. The relative scale of different impacts will depend on the scale of housing and the distribution of that housing in relation to the SPA. In this report we focus on disturbance to Annex I bird species, and this is the focus of later sections of the introduction.

Table 1: Summary of key negative impacts (besides disturbance to birds) of development close to European heathland sites. Table is adapted from Liley *et al.* (2006b)

Effect	Description and Impact	Examples of species / species group affected	Key references
Fragmentation	Loss of supporting habitats	Nectar feeding invertebrates; nightjar, woodlark	Alexander & Cresswell (1990)
	Lack of connectivity between sites preventing movement / genetic exchange between sites	Invertebrates, plants, reptiles, birds and mammals	Piessens *et al.* (2004; 2005)
	Smaller site size increases edge effects from non-heathland species	Invertebrates and plants	Webb (1989); Webb & Vermaat (1990); Webb (1990); Webb & Thomas (1994)
Predation and increased mortalities	Access by pet cats, some of which feed on the heath	Birds, invertebrates, reptiles and amphibians	Woods *et al.* (2003); Sims *et al.* (2008); Baker *et al.* (2008); Van Heezik *et al.* (2010)
	Higher densities of mammalian predators such as foxes present on more urban heaths	Birds, reptiles, mammals.	Taylor (2002)
	Increase in crows and magpies on sites with greater human activity	Birds, invertebrates, reptiles and amphibians	Marzluff & Neatherlin (2006)
Roads	Road kills from traffic	Birds, invertebrates, reptiles and amphibians	Erritzoe (2003)
	Increased levels of noise and light pollution	Birds, invertebrates	Reijnen *et al.* (1995)
	Roads are barriers to species mobility	Invertebrates	Mader *et al.* (1990)
Pollution / Hydrology	Ground and surface water pollution from roads and hard surfaces, spills and dumping.	Vegetation communities, macroinvertebrates in watercourses	Armitage *et al*. (1994)
	Air pollution from industrial uses, fires and vehicles	Vegetation communities	Bobbink *et al.* (1998); Angold (1997); Bignal *et al.* (2007)
Trampling	Soil compaction	Plant communities and species. Invertebrates	Lowen *et al.* (2008)
	Soil erosion from walkers, cyclists and horse riders	Plant communities and species, some invertebrates benefit	Lowen *et al.* (2008); Liddle (1997)
	Damage to breeding and wintering sites	Invertebrates and reptiles	
	Creation of extensive path network increases spatial disturbance	Birds, reptiles	
Vandalism	Damage to signs, fences, gates		
Eutrophication	Enrichment of soils from dog excrement.	Plant communities and species, invertebrates	Bonner & Agnew (1983); Taylor *et al.* (2005)
	Dumping of household and garden rubbish.	Plant communities and species, invertebrates	Liley (2004)

Effect	Description and Impact	Examples of species / species group affected	Key references
	Enrichment along road corridors, effects of dust, salt, run-off	Plant communities and species, invertebrates	Angold (1997)
Fires	High fire incidence on urban heaths. Direct mortality of fauna. Temporary removal of breeding and foraging habitat	Birds, invertebrates, reptiles and amphibians	Kirby & Tantrum (1999)
	Long term vegetation change from repeated fires	Vegetation communities	Bullock & Webb (1994)
Restrictions on management	Stock grazing: gates left open, dogs chasing/injuring animals, inappropriate feeding or theft of stock		
	Objections to management e.g. tree clearance		Woods (2002)
	Increased costs of wardening		
Negative public perception	Disregard of access and activity restrictions, hence trampling, dog fouling, fire lighting, illegal motorcycling etc.	Vegetation communities, birds, invertebrates, reptiles and amphibians	

Habitats Regulations 2010

1.9 European sites are protected through the provisions of the Conservation of Habitats and Species Regulations 2010 (SI no. 490), usually referred to as 'the Habitat Regulations'. These Regulations transpose the requirements of both the Habitats Directive (Council Directive 92/43/EEC) and the Wild Birds Directive (Council Directive 79/409/EEC) into UK law. The following regulations are relevant to this report:

1.10 Article 6(2) of the Habitats Directive requires Member States to take appropriate steps to avoid the deterioration of natural habitats and the habitats of species and avoid the disturbance of species, for which the a European site has been designated or classified, preventing deterioration and disturbance that could be significant in relation to the objectives of the Directives. Article 6(2) states that "Member States shall take appropriate steps to avoid..... deterioration of natural habitats.... as well as disturbance of the species..."; the wording therefore puts a responsibility on the Member State to address such issues where they arise. The wording of the Directive is such that it is clear that there is an ongoing responsibility to ensure that European sites remain in, or are managed to enable them to return to, a healthy and viable ecological state.

1.11 Regulation 61 implements the provisions of Article 6(3) of the Habitats Directive such that competent authorities can only agree to a plan or project which is likely to have a significant effect on a European site (either alone or in-combination) after having ascertained that it will not adversely affect the integrity of any European site (subject to exceptional cases where there are no alternative solutions and imperative reasons of over-riding public interest for the plan or project). Urban impacts arising as a direct or indirect result of a particular or a number of plans or projects should therefore be prevented through the correct application of Regulation 61 by competent authorities.

1.12 The separation of the ongoing duty of care set out within Article 6(2) and the specific requirement for the assessment of plans and projects under Article 6(3) therefore leads to a separation in the consideration of disturbance issues, with Habitats Regulations Assessments generally making a clear distinction between disturbance associated with or occurring as a result of a plan or project, and other disturbance issues, normally those already in place and to which a link to specific plan(s) or project(s) cannot reasonably be established.

1.13 When considering impacts associated with recreational activities, it is therefore important to appreciate the difference between impacts that can be associated with a plan or project (as referred to in Article 6(3) of the Habitats Directive and Regulation 61 of the Habitats Regulations), and impacts that cannot reasonably be associated with a plan or project which should be addressed either through 'necessary conservation measures' as required by Article 6(1) or 'appropriate steps' as required by Article 6(2).

Aims and Objectives of this report

1.14 There are a number of studies that show disturbance can have an impact on the three Annex I bird species that are the interest features for the Breckland SPA. This report is therefore necessary to understand:

- The scale of any impact and scale of impacts in the future
- The links between the disturbance and any development

1.15 Within this report we therefore start by providing a review of the evidence-base relating to disturbance impacts to the three Annex I bird species. This review section provides the context for the later stages of the report, setting out how disturbance can impact the three species. The review section also considers existing studies that have researched visitor access patterns within the Breckland SPA.

1.16 Later sections of the report set out the results of the visitor survey, which are then discussed in context within the review section and the implications for development with St. Edmundsbury Borough and Forest Heath Districts.

2 Context: Our Current Understanding

2.1 Disturbance has been shown to have particular impacts for the three Annex I bird species relevant to Breckland SPA and we summarise this information here.

Nightjars and Disturbance

2.2 Several studies have demonstrated clear links between human disturbance and both density and breeding success in European nightjars (Murison 2002; Liley & Clarke 2003; Liley, Clarke, Mallord, et al. 2006; Langston, Liley, et al. 2007; Clarke, Liley, & Sharp 2008). Modelling using data from the most recent national survey (in 2004) suggests that the nightjar population on the combined Dorset Heaths and Thames Basin Heaths SPAs would be 14% higher were there no nearby housing or visitor pressure (Clarke et al. 2008). On the Thames Basin Heaths (where visitor pressure is higher than Dorset), nightjars demonstrate a general preference for areas away from access points and site edges. There is a clear trend for nightjar density to decline with increasing visitor pressure, with nightjars appearing to avoid highly disturbed areas within sites. This decline is gradual, and there is not a clear cut-off point at which a marked change in nightjar density occurs. The trend is similar but less clear on the Dorset Heaths (Liley, Clarke, Mallord, et al. 2006). However, on the Dorset Heaths a negative correlation was shown for urban development or people density and nightjar density, regardless of the size of heathland studied (Liley & Clarke 2003); urban development density could be considered a rough proxy for recreational access levels.

2.3 Studies on 10 Dorset heaths revealed that nightjars had significantly higher breeding success at sites with no public access than those with open access. Nests had a greater chance of failure on open access sites with more surrounding urban development and increasing proximity to a greater density of footpaths (Murison 2002). Nightjar nests that failed were significantly closer to paths (45 m compared to 150m for successful nests) and tended to be closer to the main access points. Nightjar territories had fewer paths within 100m than did random points. No significant differences in levels of path usage and nest failure were detected. Incubating nightjars sit tight unless disturbed; in 2,000 hours of camera observations of eight nests, nightjars never left the nest unattended during the day unless disturbed (Langston, Liley, et al. 2007).

2.4 Humans and dogs flush nightjars from their nest, the flushing rate being positively associated with height of the vegetation around the nest (presumably because nightjars cannot see the cause of the disturbance); and negatively correlated with the extent of nest cover (Murison 2002; Langston, Drewitt, & Liley 2007; Langston, Wotton, et al. 2007). Flushing during daylight leaves nightjar eggs or chicks vulnerable to predation, the proximate cause of nest failure (Murison 2002). Use of remote cameras fixed on nests documented a single instance of predation: The predator was a carrion crow *Corvus corone* (Woodfield & Langston 2004), but this species may be responsible for 60% of nest failures (Murison 2002).

2.5 Within the Breckland SPA specific work to look at the breeding success of nightjars and woodlarks (Dolman 2010) was commissioned by Breckland District Council to inform Habitats Regulations Assessments for their Local Development Framework strategy

documents. The study (summarised by Liley, Underhill-Day, & Tyldesley 2010) aimed to explore the links between disturbance, predation and the nesting behaviour of the two species. Using nest cameras Dolman recorded in detail the behaviour of birds at the nest, the frequency with which adults were flushed from the nest and the causes of nest loss. Counts of visitors and predators also took place, allowing the analysis to determine whether predator abundance or rates of nest loss were related to recreational use of the sites. The results provide an indication that nest loss is relatively high and that a range of predators are involved. Most of the predators recorded, such as badger and fox are nocturnal, and the results showed no indications that predator abundance are related to recreational use. The implication therefore is that disturbance from recreational access is not affecting nightjar and woodlark breeding success.

2.6 While the results of the Dolman study are encouraging, there are important additional considerations. Firstly, Dolman did not consider to what extent the distribution of the birds was related to disturbance; for example it could be that the settlement patterns of the birds are such that they do not nest in areas where disturbance levels are high. Secondly the levels of access within Thetford Forest are currently much lower than other sites (where disturbance has been shown to have an impact) (see Liley et al. 2008 for comparison between sites).

Stone curlews and Disturbance

2.7 The principal work on stone curlews and recreational disturbance was conducted on Salisbury Plain. Taylor (2007) looked at the behavioural response of incubating stone curlews to potential disturbance events in the vicinity of the nest. Stone curlews responded to disturbance by becoming alert and then temporarily leaving the nest, and Taylor recorded the distance (between the source of the disturbance and the nest) at which these responses occurred. Her results showed that stone curlews leave the nest in response to disturbance at considerable distances and that the closer a potential source of disturbance, the greater likelihood that the birds would respond by leaving the nest. Even at long distances (> 300 m) the probability of the stone curlew running or flying was elevated, relative to that when the disturbance was further away or absent. The probability of response per unit distance also varied with the type of disturbance. For example, after allowing for the effect of distance, birds were more likely to respond by running or flying from a walker with a dog than a walker without a dog, or than a motor vehicle. While these results do not show any population impact of disturbance, the behavioural response shows that the species is particularly sensitive to the presence of people. Repeated flushing has the potential for consequences on the health of the adult in terms of energy use and leaves the nest vulnerable to predation.

2.8 While not directly related to disturbance, the distribution of stone curlews in Breckland shows a clear pattern in relation to buildings, with stone curlew density showing a significant negative relationship to the number of buildings in the vicinity (Sharp et al. 2008).

Woodlarks and Disturbance

2.9 Across 16 sites in southern England woodlark population density was found to be significantly lower at sites with higher disturbance levels (Mallord et al. 2006, 2007). This supported previous findings that density of woodlark territories is significantly reduced on sites with open access compared to those with restricted access (Liley & Clarke 2002). This pattern was thought to be due to birds not nesting (but nevertheless still foraging) in the most heavily visited areas.

2.10 At sites with recreational access, woodlarks were found to be less likely to colonise suitable habitat in areas with greater disturbance; eight disturbance events per hour reduced the probability of colonisation to below 50%. However, the lower woodlark density at more highly disturbed sites resulted in greater breeding success, in terms of more fledged chicks per pair, i.e. high disturbance levels produced a strong density-dependent increase in reproductive output (Mallord et al. 2006, 2007).

2.11 Mallord developed a model to predict the consequences for the woodlark population of a range of visitor access levels (Mallord et al., 2006). This suggested that recreational disturbance is thought to be having a major adverse effect on woodlark populations in Dorset already. Any further population impact is likely to depend on the spatial distribution of visitors as well as overall numbers. Under current access arrangements, a doubling of visitor numbers is predicted to reduce population size by 15%. If visitor levels doubled and visitors spread equally across sites, a 40% population decline is predicted (Mallord et al. 2006, 2007). If disturbance at 16 heathland sites were to be removed, it is predicted that the breeding population of woodlarks would increase by 13–48% (Mallord 2005).

2.12 Within Breckland there have been recent studies, using nest cameras, to assess causes of nest loss and possible links to disturbance (see nightjars above). Useful additional context is provided Wright *et al.* (2009) who explore the importance of weather conditions and predation in explaining the fluctuations of woodlark numbers in the Brecks over a 35 year period. Their results show that during the period 1971 to 1988 the population grew slowly, during 1988–1999 the population grew rapidly, but after 1999 the population declined. Population decline after 1999 was caused by a combination of reduced productivity (resulting from increased nest failure rates attributed to predation) and lower first-year survival rates. Predation therefore appears to be a particularly important issue for this species in the Brecks.

Making links between Housing, Access and Disturbance

2.13 A number of visitor surveys have taken place to assess visitor use of heathland SPAs in recent years. These surveys have been specifically aimed at understanding the links between development and recreation. Many of the key heathland areas within southern England, including the Dorset Heaths (Clarke et al. 2006), Brecks (Dolman, Lake, & Bertoncelj 2008), the Wealden Heaths (UE Associates), the Thames Basin Heaths (Liley, Jackson, & Underhill-Day 2006), Ashdown Forest (UE Associates 2009), and the New Forest (Tourism South East Research Services & Geoff Broom Associates 2005) now have detailed, tailored visitor studies, often following similar methods. In

addition for Dorset there has been a postal survey of randomly selected households around the heaths (Clarke, Sharp, & Liley 2008; Liley, Sharp, & Clarke 2008). A review of heathland visitor surveys is provided by Underhill-Day & Liley (2007).

2.14 A general pattern is emerging. Heathlands draw local people for a range of recreational activities such as dog walking, walking, exercise (jogging, power walking). Dog walkers seem to particularly be attracted to heaths (Clarke et al. 2008; Liley et al. 2008), drawn by the ability to let the dog off the lead in a large area of habitat with interest for the dog, and the lack of restrictions (for example requirements to keep dogs on leads or pick up after their pet). Differences between sites/studies are probably a reflection of site attributes (relative attractiveness of sites, facilities etc.), the relative availability of other places to visit and the spatial distribution of housing. Perhaps notable is the distances travelled to different sites, with work in the New Forest (Tourism South East Research Services & Geoff Broom Associates 2005) and Ashdown (UE Associates 2009) highlighting people travelling considerable distances to reach these particular sites. While local people often visit sites regularly for short periods – such as the daily dog walk – some heaths, such as within the New Forest and at Ashdown, also draw people for longer day-trips and even staying tourists. Such visitors behave differently to regular visitors and are drawn to the sites for different reasons. Visitors coming for a day-trip may come from a wide geographic area (essentially meaning that development in a wide area may have consequences for access levels). Management issues on such sites, when there are a range of different types of visitor, become potentially more complex (Sharp, Lowen, & Liley 2008).

2.15 The variation between sites highlights the need for tailored visitor surveys targeted to each SPA where recreational disturbance is a potential issue. In light of the regulatory provisions, it is important to understand the extent to which there is a real and credible link between the potential impacts and development per se (and hence with a 'plan or project' as identified in regulation 61). It is important to understand the distances at which visitors are drawn to visit protected sites, and also the proportion of residents at a given distance that do actually visit. Such visitor work needs to be considered in light of the SPA interest and ecological work on those interest features and the impacts of recreation. With an understanding of these underlying patterns of recreational use and the ecological context it is then possible to determine whether any measures are necessary to avoid or mitigate any impacts from new development and if so what measures could be put in place. There are now a number of examples where such work has been incorporated into strategic plans and the production of Local Development Frameworks. For example across the south-east Dorset sub-region a 400m no development zone has been established around the Dorset Heathland sites and then an additional zone of 5km has been established within which developer contributions are collected to fund wardening and various projects to limit the recreational impacts to the European sites.

Aims and objectives

2.16 In this report we set out the results of on-site visitor surveys that involve direct counts of visitors and interviews with samples of visitors at a range of locations within the

Breckland SPA. Visitor data are necessary to establish the current level of recreational pressure within the SPA and also to understand visitor patterns.

2.17 The information gathered from the survey will allow us to compare levels of visitor pressure throughout the SPA and determine whether certain locations are more popular with certain user groups or more heavily used by visitors undertaking a specific activity. We will also consider how far people travel to visit the SPA and whether this can be linked to current levels of housing.

2.18 Car park transects provide a snapshot of the number of vehicles parked within the SPA and provide general indication of visitation by those arriving by car.

3 Methods

Selection of survey locations

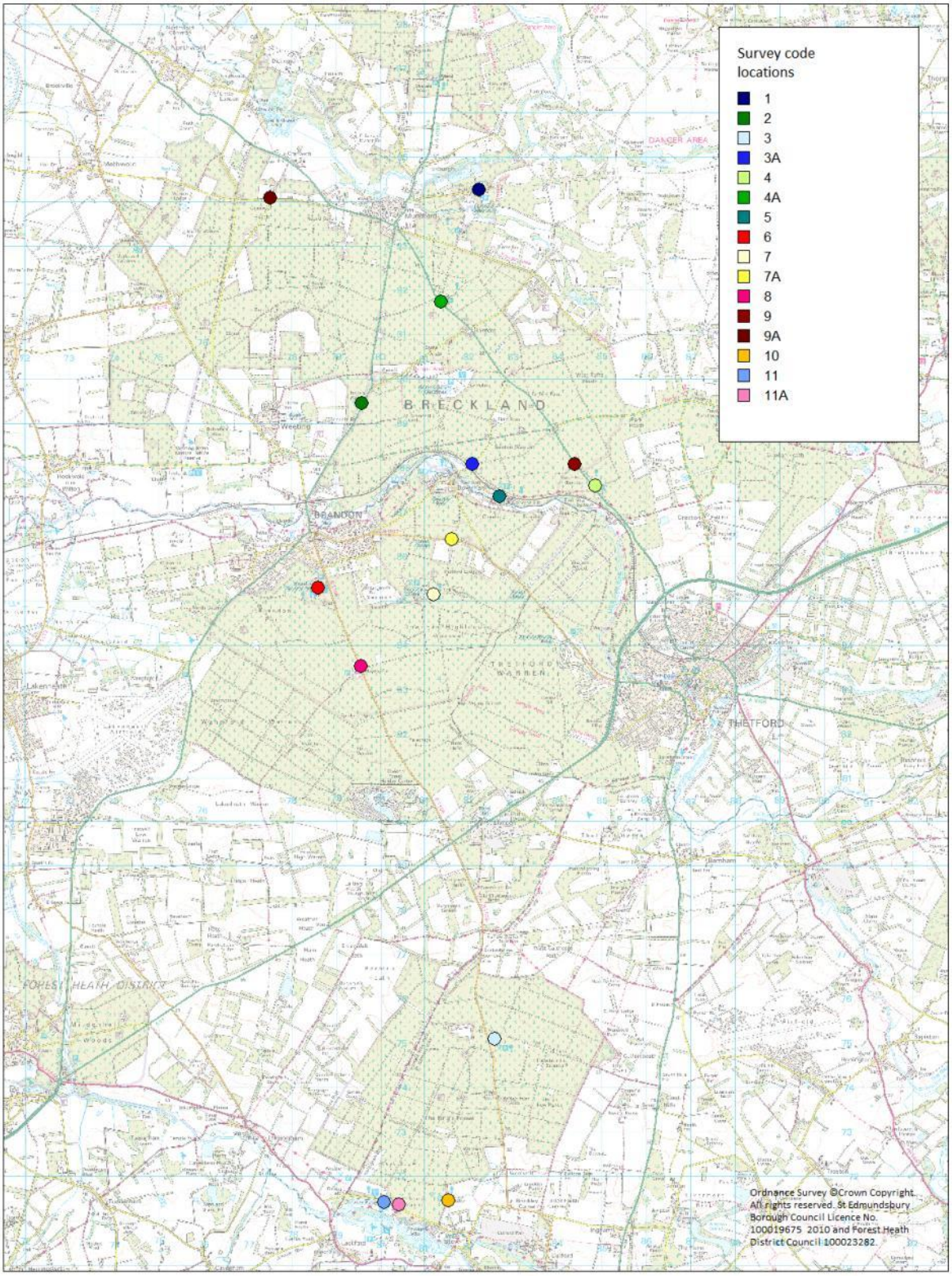
3.1 Eleven suitable survey locations were identified following consultation with the Forestry Commission, Forest Heath District and Edmundsbury Borough Councils. The locations were chosen to provide a sample of places that might be visited by residents of Forest Heath District and St. Edmundsbury Borough.

3.2 Three survey locations with informal car parking were included in the visitor monitoring; Mayday Farm Layby, Forest Track 24 and Emily's Wood. The remaining eight monitoring locations were all areas of formal parking either as part of a country park or advertised picnic area.

3.3 Three visitor centres were surveyed – Brandon Country Park, High Lodge and West Stow Country Park. The car parks at High Lodge and West Stow Country Parks did not open until 9am so informal areas of parking situated close to the main parks were monitored between 7am – 9am.

3.4 Anti-social behaviour was encountered at three locations - Forest Track 24, Two Mile Bottom picnic area and at Kings picnic area. Visitor monitoring was therefore moved to alternative locations -the car park adjacent to a level crossing near Santon Downham replaced the Forest Track 24, Lynford Stag picnic area replaced Two Mile Bottom picnic area and the car park at Cranwich Heath was used as an alternative to the Kings picnic area. All visitor monitoring locations are detailed in Map 2 and the site codes are listed in Table 2.

Map 2: Visitor survey locations



Visitor surveys

3.5 The visitor survey work focussed on people counts and interviews with a random sample of visitors. Counts and interviews were conducted at all survey points, to capture the range of recreational use believed to occur at each. The surveyor undertook the counts and interviews in two-hour sessions, spread over a day (07:00 – 09:00; 10:00-12:00; 13:00-15:00; 17:00-19:00). The aim was to undertake this level of coverage on a weekend day and a weekday at all locations, allowing direct comparison between survey locations.

3.6 During the course of the survey work it was decided to switch some of the survey locations, as it was clear that anti-social behaviour was making the survey work difficult, uncomfortable for the surveyors and potentially biasing the people interviewed. As these concerns only arose during the course of the survey work, survey effort was not consistent across all sites. Two of the surveyed country parks did not open until 9am and so the number of survey hours at these sites is also reduced. Table 2 details the number of survey session undertaken at each location and Table 3 lists the facilities available to visitors per survey location.

Table 2: The number of two hour interview session undertaken at each survey location. Anti-social behaviour was present at sites marked with *, refer to sections 3.3 and 3.4 for details of alternative survey locations. Locations with complete survey coverage are shaded grey

Location Code	Survey location name	07:00-09:00	10:00-12:00	13:00-15:00	17:00-19:00	Total number of two hour sessions
1	Lynford arboretum and water	2	2	2	2	8
2	Emily's Wood car park	2	2	2	2	8
3*	Forest track fire route 24	1			1	2
3A	Forest track fire route 24 - Alternative location, level crossing car park		1	1		2
4*	Two Mile Bottom picnic area	1	1	1	1	4
4A	Two Mile Bottom - Alternative location, Lynford Stag	2	2	2	2	8
5	St. Helens Picnic Area	2	2	2	2	8
6	Brandon Country Park	2	2	2	2	8
7	High Lodge Visitor Centre - Santon Downham		2	2	2	6
7A	High Lodge - Alternative location, firebreak 18 (7am-9am only)	2				2
8	Mayday Farm	2	2	2	2	8
9*	Kings Picnic area	1	1	1	1	4
9A	King Picnic area - Alternative location, Cranwich Heath	1	1	1	1	4
10	West Stow Picnic area	2	2	2	2	8
11A	West Stow - Alternative location, layby (between 7am-9am only)	2				2
11	West Stow Country Park		2	2	2	6

Table 3: Facilities available to visitors at each survey location

Location Code	Survey location name	Parking type	Parking Capacity	Marked walking trails	Marked cycling trails	Easy access for disabled / buggies	Toilets	Picnic areas	Refreshments	Interpretation	Other
1	Lynford arboretum and water	Formal	50	✓		✓		✓		✓	
2	Emily's Wood car park	Informal	40								
3*	Forest track fire route 24	Informal	20								
3A	Forest track fire route 24 - Alternative location, level crossing car park	Formal	6	✓							
4*	Two Mile Bottom picnic area	Formal	60	✓		✓		✓		✓	
4A	Two Mile Bottom - Alternative location, Lynford Stag	Formal	60	✓		✓		✓	✓		Children's play area
5	St. Helens Picnic Area	Formal	180	✓		✓		✓			BBQ's permitted
6	Brandon Country Park	Formal	100	✓	✓	✓	✓	✓	✓	✓	Shop Visitor Centre
7	High Lodge Visitor Centre - Santon Downham	Formal	150	✓	✓	✓	✓	✓	✓		Go Ape Bike Art Adventure playground Shop BBQ Hire
7A	High Lodge - Alternative location, firebreak 18 (7am-9am only)	Informal	4								
8	Mayday Farm	Formal	25	✓	✓	✓				✓	Bird Hide
9*	Kings Picnic area	Formal	100	✓				✓		✓	Children's play area
9A	King Picnic area - Alternative location, Cranwich Heath	Formal	10								
10	West Stow Picnic area	Formal	30	✓				✓		✓	
11A	West Stow - Alternative location, layby (between 7am-9am only)	Informal	4								

11	West Stow Country Park	Formal	100	✓		✓	✓	✓	✓	✓	Museum Anglo – Saxon village Shop Adventure play ground Bird Hides

3.7 During each two hour period the surveyor recorded the number of people (and the number of groups) passing (i.e. entering and leaving if at an access point). Separate totals were recorded for entering and leaving. The number of dogs was also counted. As many people leaving the site as possible were interviewed. Only one person (selected at random) from each group / party was interviewed. The following survey protocol was followed:

- Surveyors were usually based at their car at an access point, and had a large poster with logos highlighting that they were undertaking a visitor survey.
- Surveyors carried photo ID.
- No unaccompanied minors were approached or interviewed.
- Surveyors carried business cards that were handed out to anyone wanting to check their identity.
- Surveyors were polite and courteous at all times.
- Surveyors were trained in the questionnaire and interview approach, ensuring standard sampling.

3.8 The visitor questionnaire (Appendix 1) was designed to record and capture the following visitor information:

- Access points used
- Activities undertaken
- Home postcode of the visitor
- Route travelled on site
- Identify opinions relating to management issues and potential changes
- Other parts of the area visited
- Route taken on site
- Whether a local resident or visiting tourist

Visitor postcodes

3.9 Each interviewed visitor to Breckland SPA was asked for the full postcode from which they had travelled. Postcodes from the interview data were geocoded (plotted) using a standard Royal Mail postcode database (Postzon™ 100 data). GIS (MapInfo Professional v10.0) was used to determine the distance from the home postcode of each group of visitors to the access points where interviewed.

3.10 Route data were collected from small GPS Travel Tracker[2] units which were handed to visitors as they entered the site. The routes of visitors who did not take a GPS unit on entry to the site were noted on 1:10k maps as part of the visitor questionnaire.

Mapping of car parks

3.11 All formal and informal car parking locations with their capacity were mapped from site visits.

[2] http://www.maplin.co.uk/Module.aspx?ModuleNo=227620

Driving transects

3.12 Five driving transects were conducted on the 18/6/2010, 2/7/2010, 3/7/2010, 4/7/2010 and 5/7/2010 and all cars present in the 253 mapped car parking locations were recorded. Each transect took approximately five hours to complete.

3.13 It was not possible to include all roads within the SPA in the driving transects as resources were limited. However, the transects encompassed as much of the road network (especially around the survey locations) as was practical within five hours.

3.14 The purpose of the car transects was to provide context to the targeted work at the individual survey locations and in particular to determine levels of use of some of the informal parking locations.

Data and analysis

3.15 Data analysis was conducted using Minitab (v14) and Microsoft Excel 2007. Unless otherwise stated all errors are standard errors.

3.16 Statistical tests for significance were conducted using chi-square (χ^2) and regression was also used to identify relationships from the data.

4 Results

Visitor number and overview of data

4.1 A total number of 88 visitor survey sessions were conducted equating to 176 hours of survey time. The interviews were conducted between 2nd July 2010 and 18th July 2010. Each site was surveyed on week and weekend day for eight hours between 7am and 7pm (see Table 2 specific survey times per site) except those sites where alternative survey locations were required.

4.2 The weather during the survey sessions was classified by the surveyor as either cool, mild, warm or hot and rainfall was also noted. Just over half of all surveys (52%) were conducted when it was warm, 26% when mild, 18%when hot and 3% when cold. Rainfall was recorded on 8% of the survey sessions. The weather conditions were not consistent through the survey sessions but as the monitoring was conducted in the Summer the data is reflective of summer visitation patterns, although only 22% of those interviewed had a preference for summer visitation to the area (see sections 4.12 – 4.16 for further details).

4.3 A total number of 297 visitor interviews were conducted which represents visitor information from 677 visitors (accounting for group size) and 200 dogs (Table 4). The average group size of visitors across all locations was 2.3 and this value varied with some locations more popular with larger groups of visitors (families). The average number of dogs recorded per group across all sites was 0.5. The highest number of visitors were recorded at Brandon Country Park and West Stow Country Park where the most visitor interviews were carried out. The least number of interviews were conducted at laybys near High Lodge and West Stow Country Park, both were early morning survey locations as the Parks did not open until 9am. This is not surprising as these locations were only surveyed for two, early morning two hour sessions.

4.4 The number of visitors entering all survey locations totalled 1069 with 277 dogs and the number of visitors leaving the survey locations was 855 with their 244 dogs. It is not possible to directly compare the number of visitors between all survey locations as the number of interview sessions conducted at all the sites was not constant.

4.5 The number of visitors recorded entering survey locations which were surveyed for the full eight sessions (Table 2) and at High Lodge (as visitation to the park was only within opening hours) was not consistent between sites which indicates a significant difference in visitor numbers hence visitor pressure between sites ($\chi^2_6 = 324.1$, $P<0.001$).

4.6 The average interview refusal rate across all surveyed sites was 17% but this varied greatly between sites. At Cranwich Heath, Emily's Wood, West Stow Country Park and Kings Picnic area all approached visitors were interviewed. At the early morning alternative location to High Lodge a single visitor was approached for interview and refused which accounts for the high refusal rate. If this value is removed the mean refusal rate across all surveyed areas drops to 10%.

4.7 Holiday makers accounted for 9% (30 interviews) of the total number of people interviewed while 87% of those interviewed were visiting from home. The remaining 4% were visitors who were passing through the area and lorry drivers. The majority of the analysis in this report excludes the interview data for holiday makers as we focus on the visitation patterns of local residents.

Table 4: Summary statistics from the visitor monitoring at survey locations in Breckland SPA. Anti-social behaviour was recorded at the locations marked with an asterisk. Grey shading shows locations with complete and comparable survey coverage (eight sessions).

Site Code	Location Name	Number of interviewed visitors (groups interviewed)	Number of visitors in interviewed group	Mean group size	Number of groups with dogs	Number of dogs recorded	Percentage of groups with dogs	Number of visitors recorded entering survey site	Number of visitors recorded leaving survey site	Percentage interview refusals of those approached
1	Lynford arboretum and water	26	65	2.5	10	13	38	89	72	4
2	Emily's Wood car park	17	24	1.4	10	14	59	29	28	0
3	Forest track fire route 24*	0	-	-	-	-	-	0	0	
3A	Level crossing car park	4	8	2.0	3	5	75	6	12	20
4	Two Mile Bottom picnic area*	13	42	3.2	7	9	54	58	46	19
4A	Lynford Stag	18	30	1.7	15	22	83	60	46	25
5	St. Helens Picnic Area	20	46	2.3	13	14	65	56	26	17
6	Brandon Country Park	69	161	2.3	22	27	32	324	206	1
7	High Lodge Visitor Centre - Santon Downham	27	91	3.4	2	2	7	90	74	7
7A	High Lodge - Alternative location, firebreak 18 (7am-9am only)	0	-	-	-	-	-	1	0	100
8	Mayday Farm	15	29	1.9	6	10	40	68	80	17
9	Kings Picnic area*	3	4	1.3	3	3	100	11	8	0
9A	Cranwich Heath	15	22	1.5	14	27	93	18	24	0
10	West Stow Picnic area	33	69	2.1	26	38	79	100	93	15
11	West Stow Country Park	34	82	2.4	10	13	29	153	136	0
11A	West Stow Alternative location, layby (between 7am-9am only)	3	4	1.3	2	3	67	6	4	25
	Totals	297	677	2.3	143	200	51 (mean)	1069	855	16 (mean)

Group size

4.8 Visitors (including holiday makers) to the surveyed areas did not generally visit alone. Only 29% of those interviewed were visiting alone while the remaining 25% were visiting in groups of three or above. Just under half (46%) of all of interviewed visitors were in groups of two.

Dogs and dog walking

4.9 The monitoring revealed the importance of the Breckland SPA as a place for visitors to take and exercise themselves and their dogs. At every survey location (where visitors were interviewed) dogs were also recorded. Overall 51% of the groups interviewed had a least one dog (Table 4).

4.10 Across all sites a total of 200 dogs were recorded with 143 groups. On average 1 dog was recorded with every third person (accounting for visitor group size) and 1 dog was observed with every other group. This did vary between the survey locations. Four survey locations had a particularly high percentage (i.e. above 80%) of groups with dogs Kings Picnic Area (9), Cranwich Heath (9A), Lynford Stag (4A) and West Stow Picnic Area (10) (Table 4). The 100% of groups with dogs recorded at Kings is in part reflective of the small sample size.

Temporal variation in visitor patterns

4.11 Over half of visitors (56%), who were not holiday makers visited the site at least weekly and of these 29% were daily visitors to the SPA (Figure 1). The remaining 44% visited with varying degrees of frequency ranging between less than one month to less than a year.

4.12 Visitors were also asked whether seasonality influences how frequently they visit the survey locations. The interviewees were able to select multiple answers and a total of 335 responses were noted from 269 interviews. Approximately half of the responses (47%) said that their visitation patterns are not heavily influenced by the season. While surprisingly only 22% of visitors indicated a preference for Summer visits and a further 25% had a preference for Spring and Autumn visits.

4.13 Visitors were questioned as to whether they preferred to visit an area at a certain time of day and were given the choice of six categories where multiple answers were acceptable. A total of 347 responses were given. Exactly the same percentage of responses (37%) were given for morning visitation (until 12pm) as were for afternoon visitation (12pm – 5pm) and 25% of responses given indicated there was no preferred time of day to visit. A further 10% of responses advised they generally visit after 5pm which could be reflective of the Summer survey period, when the evenings are lighter.

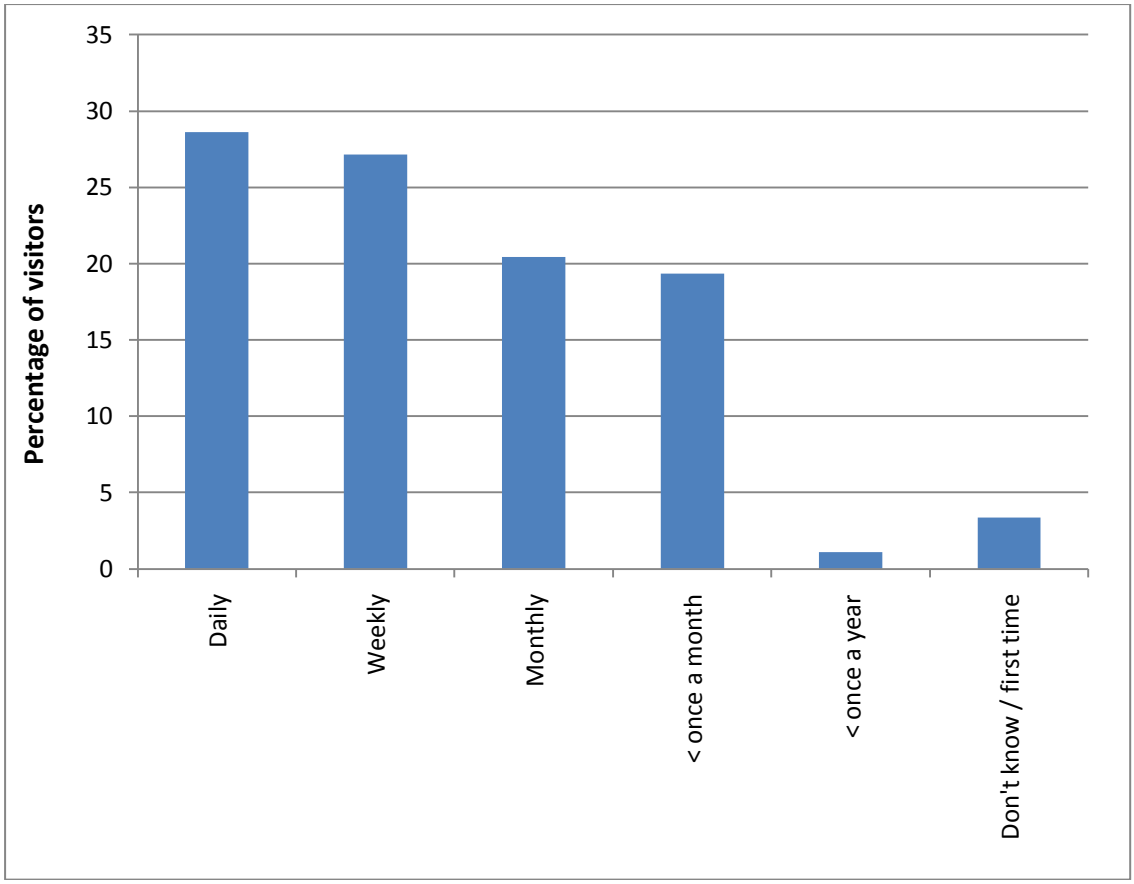


Figure 1: The percentage of non holiday making visitors grouped by frequency of visit to the SPA.

4.14 Survey effort was split equally between weekdays and weekends. Therefore if visitor use was consistent between weekdays and weekends the same number of visitors would be expected over both periods. Of the 269 groups interviewed 168 (62%) were interviewed at the weekends and 101 (48%) on weekdays. Overall the weekday to weekend ratio for the total number of visitors is very similar to the weekday to weekend ratio noted in other visitor surveys (Clarke et al. 2006; Liley et al. 2006; Fearnley, Clarke, & Liley 2010). Counts of the total number of visitors recorded entering a survey location also reflect the same pattern with 59% of visitors recorded over the weekend days and 41% on the weekdays.

4.15 Emily's Wood, West Stow Picnic Area and High Lodge were the only two locations which had a higher number of interviewed visitors on weekdays than at weekends.

Time spent at interview location

4.16 Just under half of visitors (45%) spent between 1 and 2 hours in the areas. Approximately one third of interviewees (34%) spent less than an hour visiting the location and the remaining 21% of interviewed groups visit lasted more than 2 hours.

4.17 At Mayday Farm 36% of visitors spent more than 2 hours in the area this is most likely to be reflective of the bird hide in the area and the start location of some of the more difficult cycle trails. Approximately 1 in 3 visitors to both Brandon Country Park and High Lodge also spent over two hours in these areas.

4.18 It appears that the locations for short visits are Emily's Wood, Kings Picnic Place and the Layby near West Stow Country Park with all interviewees to these areas staying less than an hour. Other short visit locations were Cranwich Heath and Lynford Stag and at both 93% of visitors also stayed less than an hour.

Activities

4.19 Visitors were asked about the main activity or activities undertaken during their visit (note that visitors can undertake more than one activity, for example dog walking and jogging). From 269 interviews, 328 responses were given equating to 1.2 activities per interviewee.

4.20 Dog walking was the most popular activity with 36% of the responses followed by walking with 24% and cycling with 16% of the responses. Collectively these activities account for 76% of the visitor responses. Just under 10% of visitor responses had specified 'other' when asked about their activities and these ranged from relieving the dog, visiting a cafe, meeting a friend, visiting the Saxon village, canoeing, swimming and a driving break.

4.21 Surprisingly only 3% of responses cited 'exercise (inc. jogging)' as their activity and despite including several picnic sites as survey locations only 3% of visitor responses cited picnicking as their visit activity. Only a small number of responses (4%) gave bird/wildlife watching and 5% a family outing.

4.22 Not every activity was undertaken at every survey location (Table 5). The percentage of people undertaking each activity differed according to the sample location (Table 5). Walking was the most popular activity at Lynford arboretum and water, Kings Picnic area and West Stow Country Park and at each of these sites there are marked trails. Cycling was the most popular activity at Brandon Country Park and High Lodge. Emily's Wood had a high percentage of 'other's. The visitor surveys did interview several truck drivers parked in the area who were all taking a break from driving as it was a convenient location to stop. The highest response activity category at Mayday Farm was exercise. At all other locations dog walking was the most frequent visitor activity.

4.23 We also considered the percentage of responses per activity over all the survey sites. This makes it easy for us to compare the relative distribution of each activity over all the sites. The percentage is calculated from the total number of responses per activity. The two sites with the highest percentage of visitors dog walking were Brandon Country Park and West Stow Picnic area.

Table 5: The percentage of interviewed visitor responses when asked 'What is the main activity you are undertaking today?' The responses are categorised by interview location. The activity with the highest number of responses is highlighted.

Location Code	Location Name	Dog Walking	Walking	Cycling	Other	Outing with family / children	Bird/wildlife watching	Picnic	Exercise	Total absolute number of responses per site
1	Lynford arboretum and water	30	37	3	20	3	7	0	0	30
2	Emily's Wood car park	36	7	0	43	0	0	14	0	14
3A	Car Park adjacent to level crossing, Alternative to Forest track fire route 24	60	20	0	0	20	0	0	20	5
4	Two Mile Bottom Picnic Area	50	29	0	0	0	0	14	7	14
4A	Lynford Stag - Two Mile Bottom - Alternative location	73	18	0	0	0	0	0	9	11
5	St. Helens Picnic Area	48	9	0	13	13	0	13	4	23
6	Brandon Country Park	24	31	34	6	1	1	1	0	83
7	High Lodge Visitor Centre - Santon Downham	7	0	57	4	25	0	4	0	28
8	Mayday Farm	29	29	29	0	0	12	0	35	17
9	Kings Picnic Area	50	50	0	0	0	0	0	0	2
9A	Cranwich Heath	81	0	0	0	6	13	0	0	16
10	West Stow Picnic area	60	17	2	2	0	2	2	0	42
11	West Stow Country Park	20	43	0	23	5	10	0	3	40
11A	West Stow Layby- Alternative location, (between 7am-9am only)	67	33	0	0	0	0	0	0	3

Table 6: The distribution of visitors per activity across all surveyed locations based on the responses from Q6 - 'What is the main activity you are undertaking today? This helps to identify which sites are most popular with visitors undertaking a specific activity. The top most popular sites for each activity are highlighted.

Location Code	Location Name	Dog Walking	Walking	Cycling	Other	Outing with family / children	Bird/wildlife watching	Picnic	Exercise
1	Lynford arboretum and water	8	14	2	19	6	17	0	0
2	Emily's Wood car park	4	1	0	19	0	0	20	0
3A	Car Park adjacent to level crossing, Alternative to Forest track fire route 24	3	1	0	0	6	0	0	0
4	Two Mile Bottom Picnic Area	6	5	0	0	0	0	20	9
4A	Lynford Stag - Two Mile Bottom - Alternative location	7	3	0	0	0	0	0	9
5	St. Helens Picnic Area	9	3	0	10	19	0	30	9
6	Brandon Country Park	17	33	55	16	6	8	10	9
7	High Lodge Visitor Centre - Santon Downham	2	0	31	3	44	0	10	9
8	Mayday Farm	4	6	10	0	0	17	0	0
9	Kings Picnic Area	1	1	0	0	0	0	0	0
9A	Cranwich Heath	11	0	0	0	6	17	0	0
10	West Stow Picnic area	21	9	2	3	0	8	10	55
11	West Stow Country Park	7	22	0	29	13	33	0	0
11A	West Stow Layby- Alternative location, (between 7am-9am only)	2	1	0	0	0	0	0	0

4.24 Walking was most common at Brandon Country Park and at West Stow Country Park while cycling was concentrated at Brandon Country Park, High Lodge and Mayday Farm. Wildlife and bird watching was mostly centred at West Stow Country Park with a lower percentage of visitors participating in this activity at Lynford arboretum and water, Mayday Farm and Cranwich Heath. The picnic areas were used for picnicking with St. Helens picnic area proving the most popular (Table 6).

4.25 Activity also appeared to influence visit length. Over half of dog walkers (56%) visits last less than an hour while two thirds of visitors taking a picnic spend over 2 hours. Almost all visitors who were cycling (98%) spent over an hour in the area with 25% of these spending over three hours in the area (Table 7).

Table 7: The percentage of visitors spending different lengths of time on site per activity.

Activity	Percentage of interviewees who's visit was less than 1 hour	Percentage of interviewees who's visit was between 1 - 2 hours	Percentage of interviewees who's visit was between 2 - 3 hours	Percentage of interviewees who's visit was more than 3 hours
Dog Walking	56	37	6	1
Exercise	45	45	0	9
Walking	29	51	13	6
Other	29	39	16	16
Picnic	20	20	50	10
Bird/wildlife watching	8	67	17	8
Outing with family / children	6	69	25	0
Cycling	2	47	25	25

Motivations for site visit

4.26 Visitors were asked what made/motivated them visit the specific interview site rather than another local site. Interviewees were able to provide more than a single answer to the question. A total of 658 responses were given by the 269 interviewees. Of the 658 responses 110 (17%) were classified as other and included comments such as 'go ape child's party', 'flat trails as dog is old', 'good marked cycle routes', 'lovely wildlife in the evening', 'meeting friends' and 'haven't been for a while'. All these responses were supplementary to the other tick box categories responses and have been excluded from further analysis.

4.27 The motivations behind visits to the survey locations were varied (Table 8). The most popular reason for visiting a specific location was 'good for activity' with 15% of all the responses followed by 'close to home and 'particular facilities at site' each with 12% of the total number of responses. Car parking and a choice of routes also featured near the top of the list with 9% of the responses. Feeling safe, habit and the habitat each had a limited number of responses.

Table 8: Visitors motivations to visit the interview site. The results are expressed as both the number of responses and the percentage of the total number of responses (excluding 'Other').

Motivation for visit	Number of responses	Percentage of total responses
Good for activity	83	15
Close to home	68	12
Particular facilities at site	65	12
Choice of routes/ability to do different circuits	51	9
Good/Easy parking	47	9
Familiarity (with tracks and site)	41	7
Short travel time from home	38	7
Good for dog/dog enjoys it	36	7
Attractive scenery/views	30	5
Safe for dog to run off lead	20	4
Not many people/quiet	20	4
Particular wildlife interest	19	3
Feel safe/Safety issues	12	2
Always visit this site/habit	11	2
Don't know	5	1
Habitat (tree cover/open areas)	2	0

Mode of transport to visitor locations

4.28 The overwhelming majority of the 246 out of the 269 (91%) interviewed visitors to the survey location travelled by car, 7% by foot, 1.5% by lorry and only 0.5% by bicycle (Table 9). Car was the most popular means of transport used to travel to all of the survey locations and all but one cyclist arrived by car.

4.29 At eight out of the fourteen sites surveyed, visitors arrived at the site exclusively by car. At only five sites did interviewed visitors arrive by foot. The site with the highest percentage of foot visitors was the car park adjacent to the level crossing at Santon Downham (location 3A) but only four interviews were conducted at this location (Table 9). The site with the highest absolute number of visitors arriving by foot was Brandon Country Park.

4.30 Just under a third of interviewed visitors (31%) to Emily's Wood arrived by lorry and reflects the popularity of the area as a rest location for drivers. The responses of these 4 interviewees have been included in the analyses as they are not on holiday and regularly stop and visit the area when passing through.

4.31 The absolute number of interviewed visitors to each survey location by their mode of arrival transport is shown in Figure 2 and illustrates that car is the dominating transport used by visitors to all the survey locations.

Table 9: The mode of transport used by visitors to the Brecks. Percentages are expressed from the total number of groups interviewed per site. The number of visitors interviewed per site is also included.

Location Code	Location Name	Car	On Foot	Bicycle	Lorry	Number of responses
1	Lynford arboretum and water	88	8	4	0	24
2	Emily's Wood car park	69	0	0	31	13
3A	Car Park adjacent to level crossing, Alternative to Forest track fire route 24	75	25	0	0	4
4	Two Mile Bottom Picnic Area	100	0	0	0	12
4A	Lynford Stag - Two Mile Bottom - Alternative location	100	0	0	0	10
5	St. Helens Picnic Area	84	16	0	0	19
6	Brandon Country Park	83	17	0	0	65
7	High Lodge Visitor Centre - Santon Downham	100	0	0	0	24
8	Mayday Farm	100	0	0	0	14
9	Kings Picnic Area	100	0	0	0	2
9A	Cranwich Heath	93	7	0	0	15
10	West Stow Picnic area	100	0	0	0	32
11	West Stow Country Park	100	0	0	0	32
11A	West Stow Layby- Alternative location, (between 7am-9am only)	100	0	0	0	3

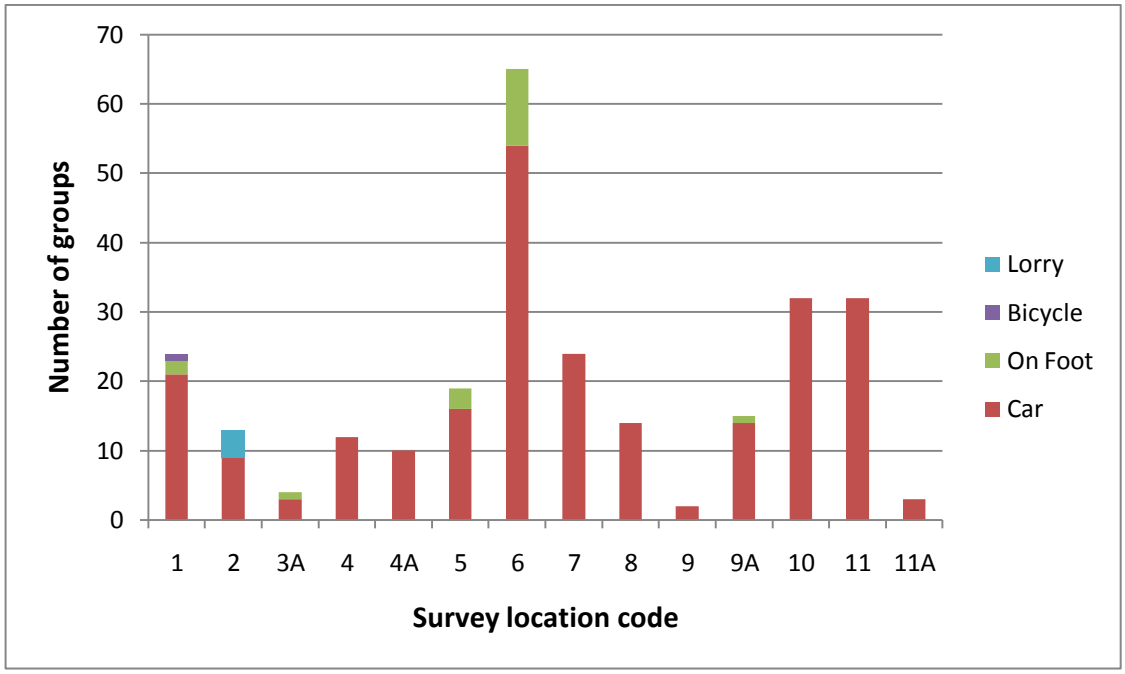


Figure 2: The number of interviewed groups arriving at each survey location by different modes of transport.

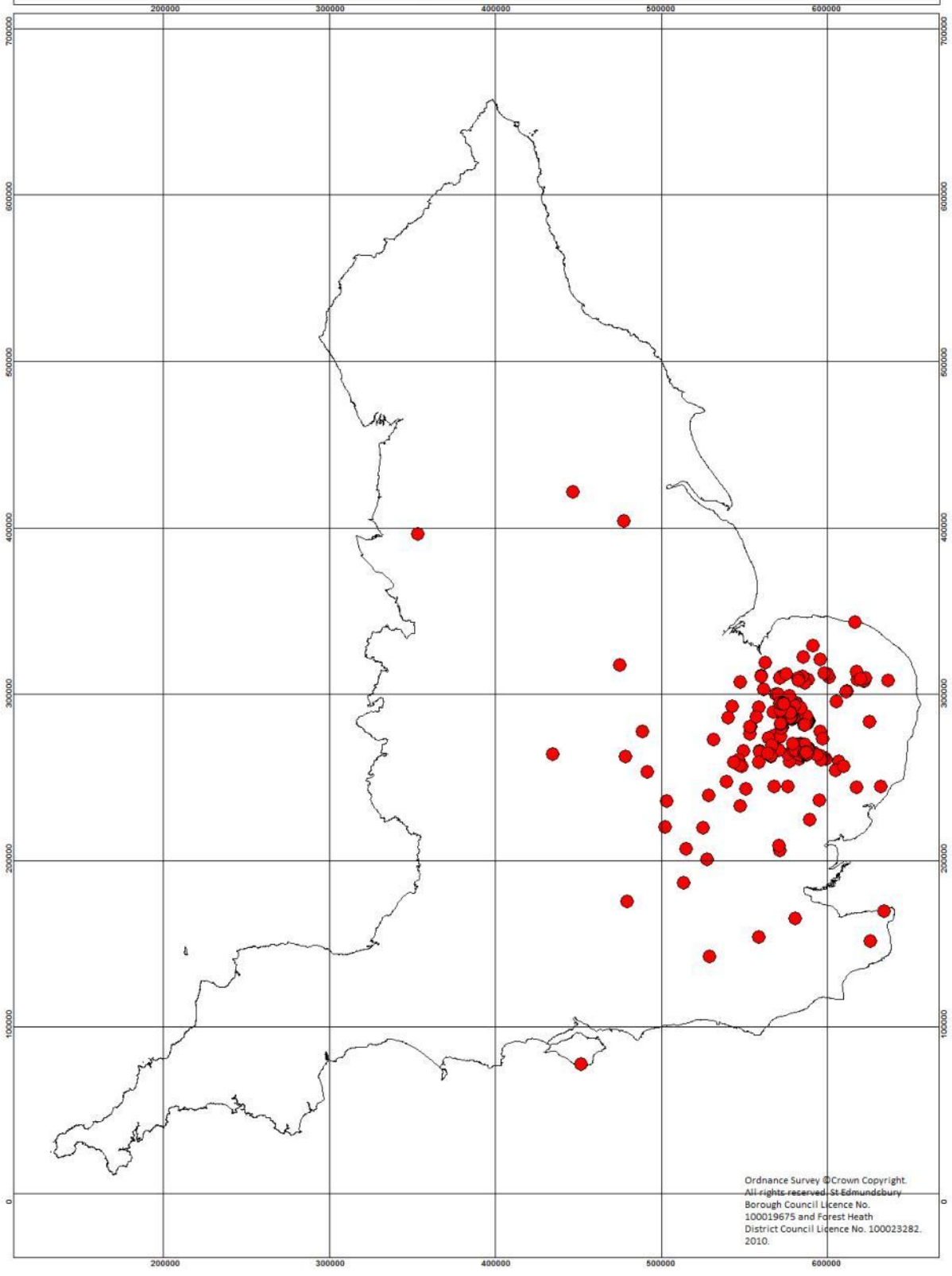
4.32 From the 297 visitors interviewed (including holiday makers) only 24 would not provide, or provided partial postcodes and 14 full postcodes were invalid, and of these there was one overseas visitor. Overall the visitor monitoring captured the home postcode location of 239 interviewees (87%).

4.33 Map 3 shows the home postcode locations of all the interviewed groups (including holidaymakers). Visitors have travelled from the Isle of Wight, Kent, West Yorkshire, Leicestershire, Warwickshire, Bedfordshire and Essex. The majority of visitors came from Suffolk, Cambridgeshire and Norfolk. The home postcode locations of regional visitors to the survey locations is illustrated in Map 4 and clearly shows that the Brandon Country Park (6), West Stow Country Park (11) and High Lodge (7) have a much wider catchment area than the other survey locations.

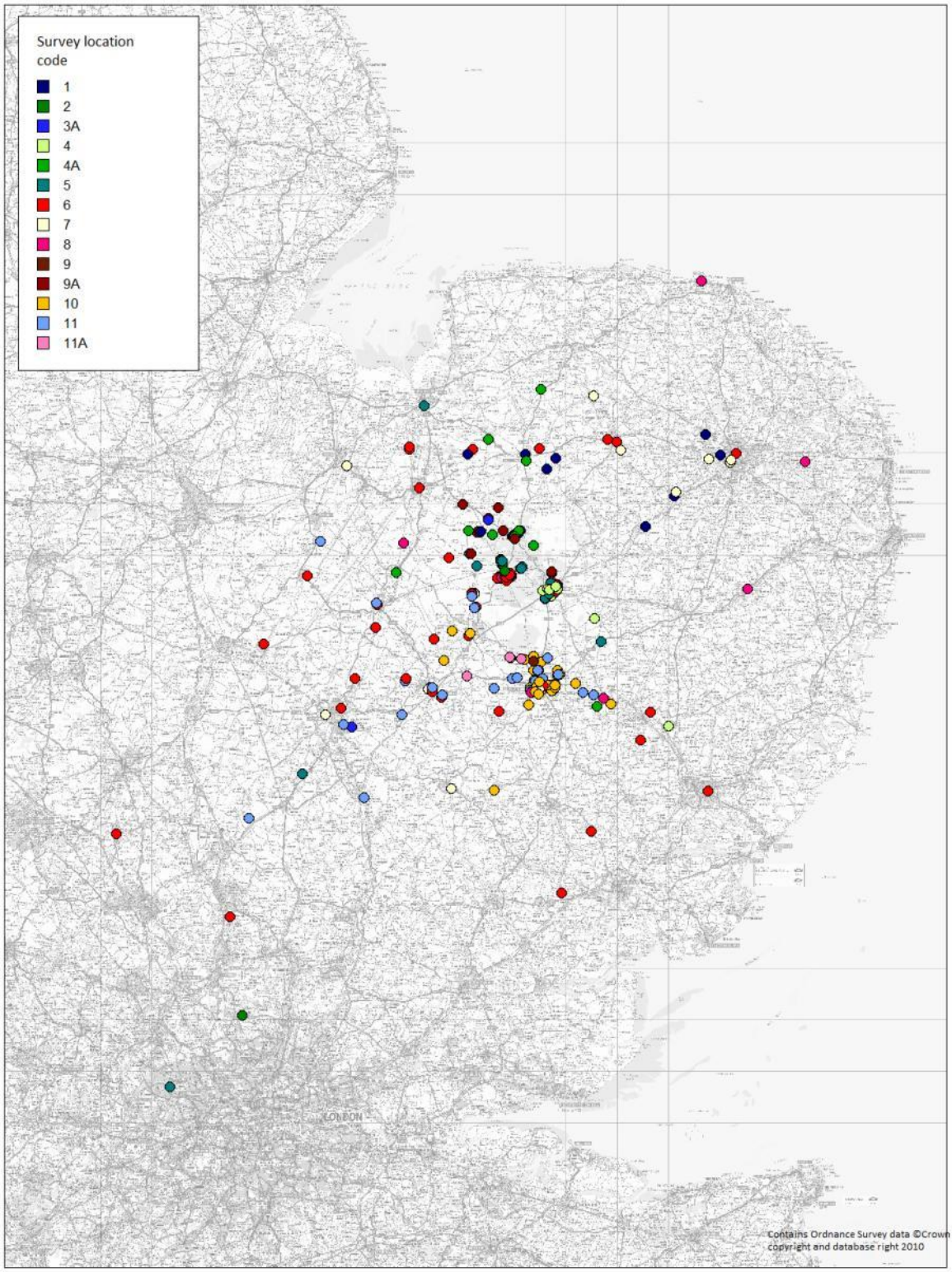
4.34 On average visitors who were not on holiday lived 16.7km from the interview locations and half of all visitors lived within 8.81km of the area they visited. The shortest distance from a postcode to a survey location was 100m and the greatest distance 151.7km.

4.35 The distance visitors travelled to undertake different activities was also investigated. Several visitors who had given dog walking as an activity also cited, walking and exercise as their motivation. In these instances the data were only analysed for dog walking. All other multiple responses were included in the analysis of the subsequent tables and figures.

Map 3: The postcodes of interviewed visitors to the Brecks SPA during July 2010



Map 4: The home postcodes of interviewed visitors to survey locations in July 2010. The visitor postcodes are colour coded (consistent with map 2) to the locations at which they were interviewed.



4.36 Visitors also appear to travel different distances to undertake different activities (Figure 3 and Table 10) which suggests that visitors are willing to travel further to enjoy certain activities in the Brecks. Over half of interviewees who were walking, cycling or wildlife watching lived a greater distance from the survey location than those undertaking other activities.

4.37 Visitors who were cycling travelled the furthest with half covering a distance of at least 31.71km. Visitors who were dog walking lived nearest the survey locations living within 5.6km of the interview location (Figure 3 and Table 10).

4.38 Visitor patterns should also be considered on a site by site as visitors were not evenly distributed across the survey locations (paragraph 4.5). The interviewed visitors travelled different distances to visit the different survey locations (Figure 4 and Table 11). Visitors travelled further distances to visit Brandon Country Park (site 6), High Lodge (site 7) and Mayday Farm (site 8). These are the three primary locations in the visitor monitoring where cycling was frequently encountered and we have already shown cyclists travel the further distance (Table 10) to undertake their activity.

4.39 The sites with the most localised use included Emily's Wood (site 2), Car park at the level crossing at Santon Downham (site 3A), Lynford Stag (site 4A), Cranwich Heath (site 9A), West Stow Picnic Area (site 10) and the layby near West Stow Country Park (Figure 4 and Table 11) also had a high percentage of visitors dog walking (Table 5).

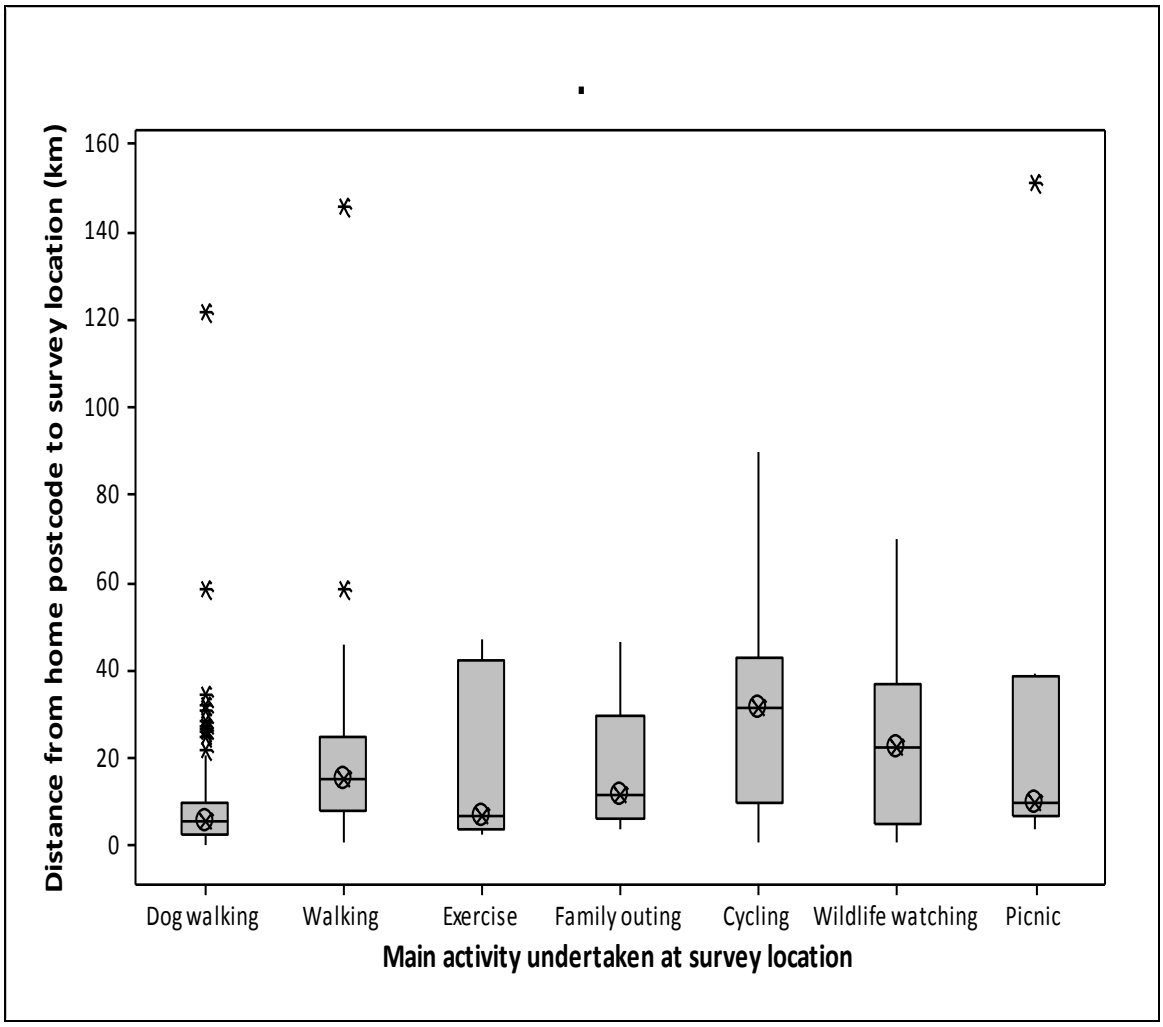


Figure 3: The distances between interview location and the visitors home postcode, grouped by the activity undertaken during a visit. The plot shows the median (i.e. the mid point – represented by a horizontal line), and the interquartile range (i.e. 25 – 75% of the data – represented by a box), while the vertical lines show the upper and lower limits of the data, with outlying values represented by asterisks.

Table 10: Distance from the visitors home postcode to site by the activity undertaken by the visitor at the interview site.

Activity	Median linear distance from home postcode to visited site (km)	Number of visitor responses given as activity
Cycling	31.7	46
Wildlife/bird watching	22.7	10
Walking	15.5	55
Family outing	11.4	15
Picnic	9.9	9
Exercise	6.9	6
Dog walking	5.6	114

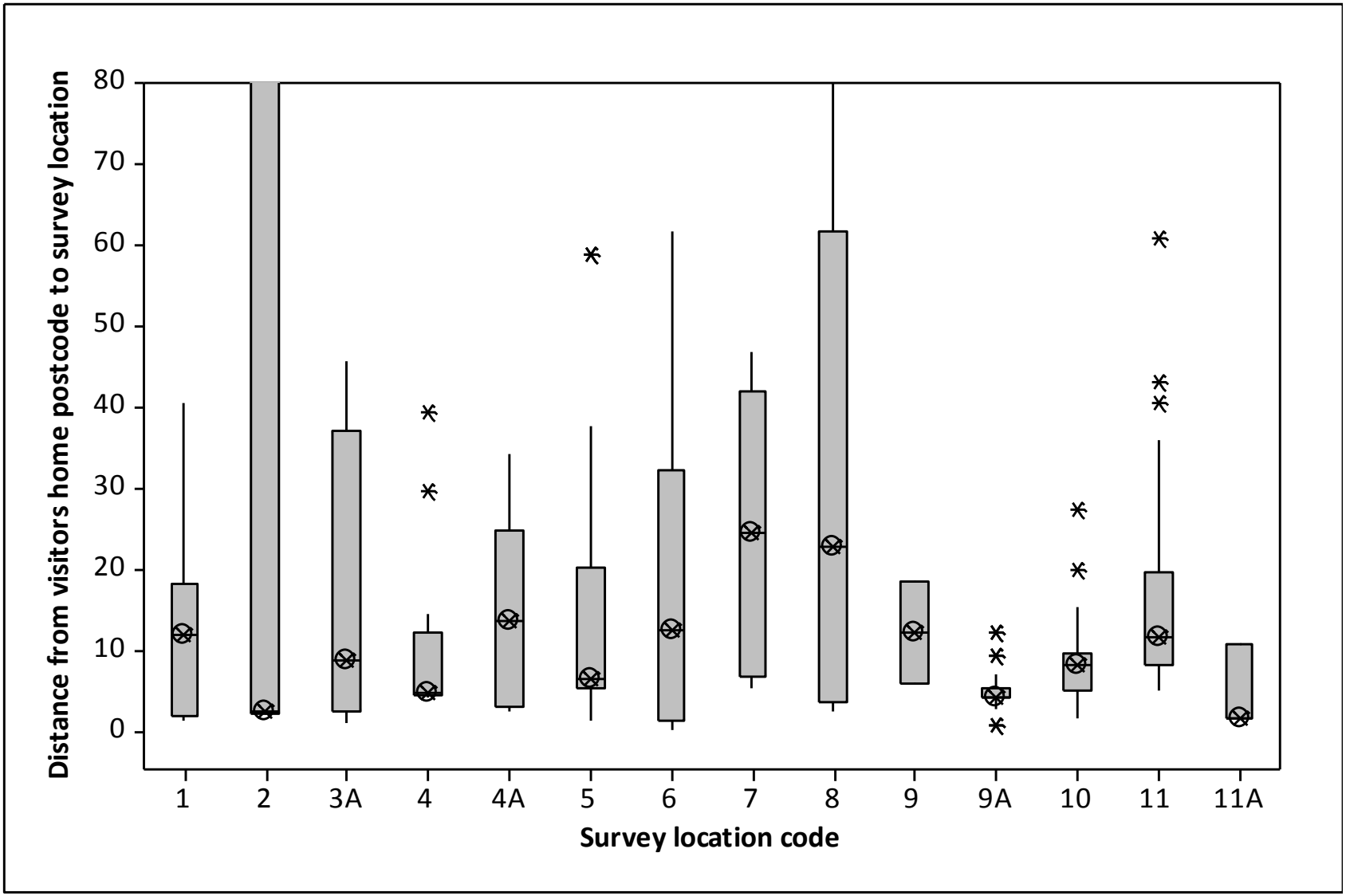


Figure 4: Distance of the visitors' home postcode to each interview location for all survey locations. The graph was truncated at 80km. The plot shows the median (i.e. the mid point – represented by a horizontal line), and the interquartile range (i.e. 25 – 75% of the data – represented by a box), while the vertical lines show the upper and lower limits of the data, with outlying values represented by asterisks.

Transport mode and distance to site

4.40 Visitors using a car travelled greater distances to reach a site than those arriving by foot (Figure 5). Half of all visitors by foot lived within 1.0km of the survey location and all lived within 1.6km (Table 12). Half of all visitors by car lived within 9.5km of the interview location and 75% lived within 25.2km (Table 12). Only one visitor travelled to a survey location by bicycle, the distance from their home postcode was 1.8km.

4.41 The overall median distance among visitors to the survey location was 8.81km. Emily's Wood was the location where visitors travelled furthest from home to visit which probably reflects popularity of this spot as a rest/driving break stop for drivers and truckers. Visitors also travelled some distance to visit Mayday Farm.

4.42 The cumulative frequency curves for visitors arriving by car (Figure 6) and on foot (Figure 7) show the localised use of the sites by residents arriving on foot when compared to the distance travelled by car visitors. Ninety percent of visitors who travelled by car to the survey locations lived within 50km and 80% lived within 30km which is a considerable distance to travel.

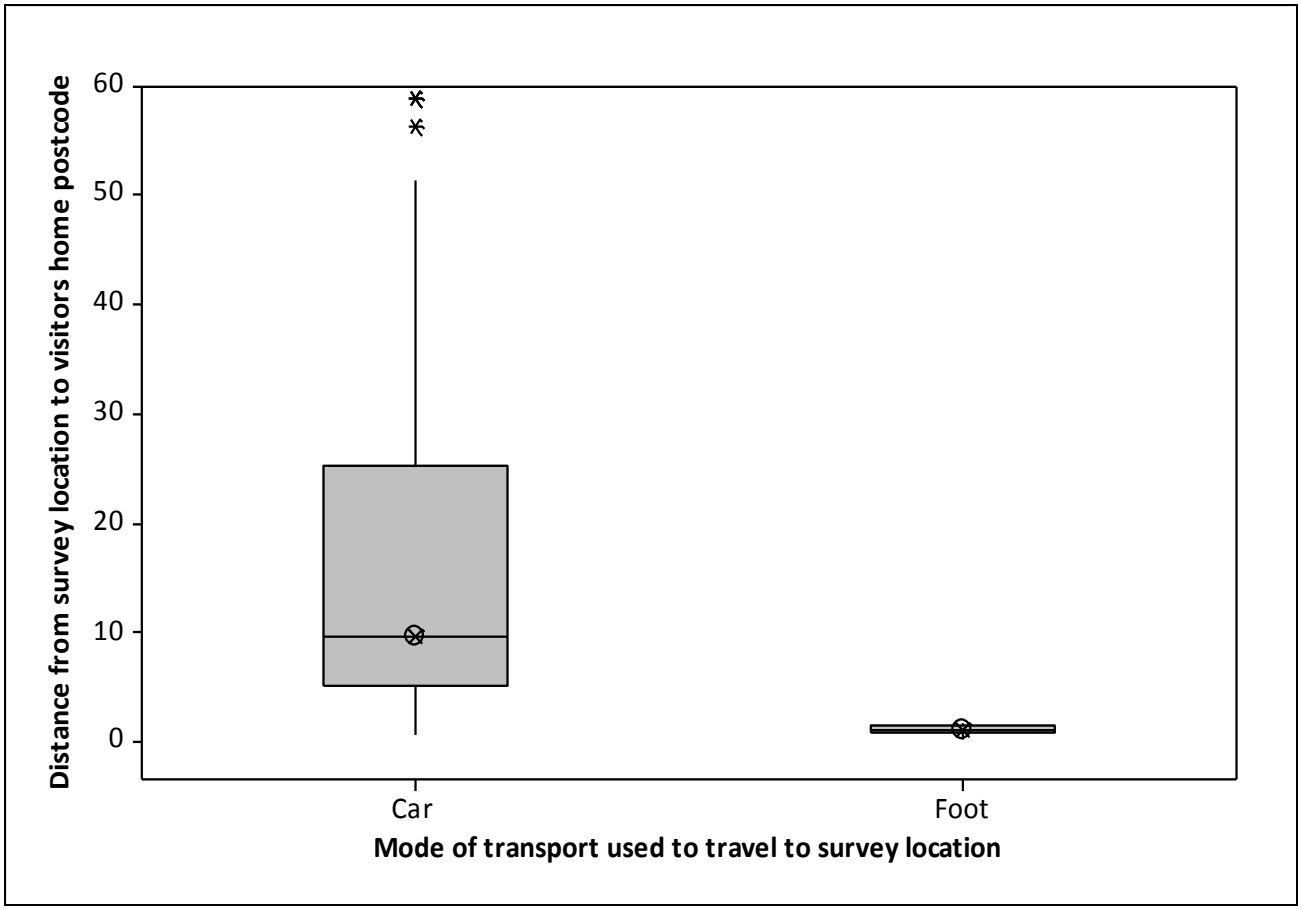


Figure 5: Distances travelled by car and foot by interviewed visitors to the survey location. The graph has been truncated at 60km. The plot shows the median (i.e. the mid point – represented by a horizontal line), and the interquartile range (i.e. 25 – 75% of the data – represented by a box), while the vertical lines show the upper and lower limits of the data, with outlying values represented by asterisks.

Table 11: Distances (km) travelled to each survey location, for all visitors (N)

Location code	Location name	N	Minimum	25%	Median	75%	Maximum
1	Lynford arboretum and water	20	1.2	2.0	11.8	18.2	40.5
2	Emily's Wood car park	6	2.3	2.3	2.6	115.0	151.7
3A	Level crossing car park	4	1.1	2.4	8.8	37.2	45.8
4	Two Mile Bottom picnic area	12	4.2	4.5	4.8	12.3	39.5
4A	Lynford Stag	20	2.4	3.1	13.6	24.7	34.2
5	St. Helens Picnic Area	26	1.3	5.3	6.6	20.3	122.0
6	Brandon Country Park	58	0.1	1.3	12.6	32.3	90.0
7	High Lodge Visitor Centre - Santon Downham	20	5.4	6.9	24.4	41.9	46.9
8	Mayday Farm	11	2.5	3.5	22.8	61.8	146.1
9	Kings Picnic area	2	5.9		12.2		18.5
9A	Cranwich Heath	28	0.9	4.1	4.3	5.3	12.0
10	West Stow Picnic area	31	1.6	5.1	8.2	9.5	27.5
11	West Stow Country Park	29	5.0	8.1	11.5	19.7	60.7
11A	West Stow - Alternative location, layby (between 7am-9am only)	3	1.6	1.6	1.7	10.7	10.7

Table 12: Distances (km) travelled to all survey locations for all visitors (N) by different modes of transport

Transport Mode	N	Minimum	25%	Median	75%	Maximum
Car	249	0.6	5.1	9.5	25.2	151.7
Foot	20	0.1	0.8	1.0	1.3	1.6

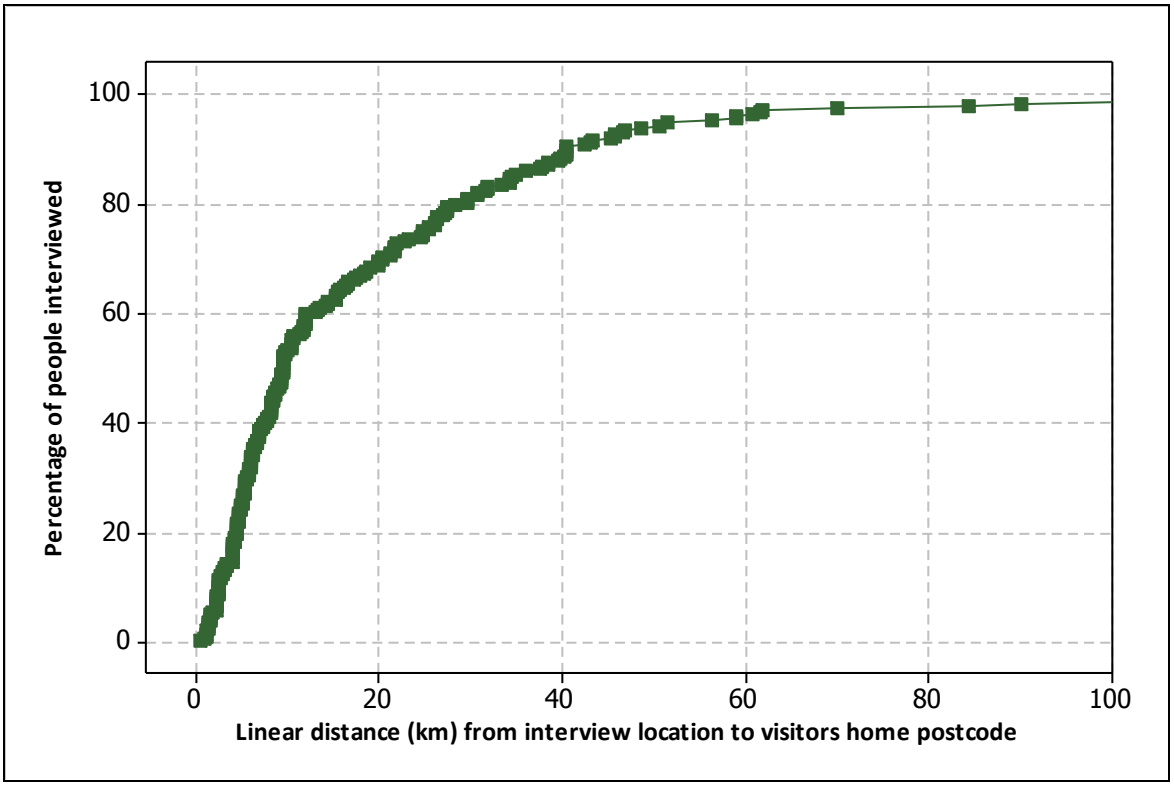


Figure 6: Cumulative frequency distribution of the linear distance by car from the interviewed visitors' home postcode to the survey location. The graph was truncated at 100km.

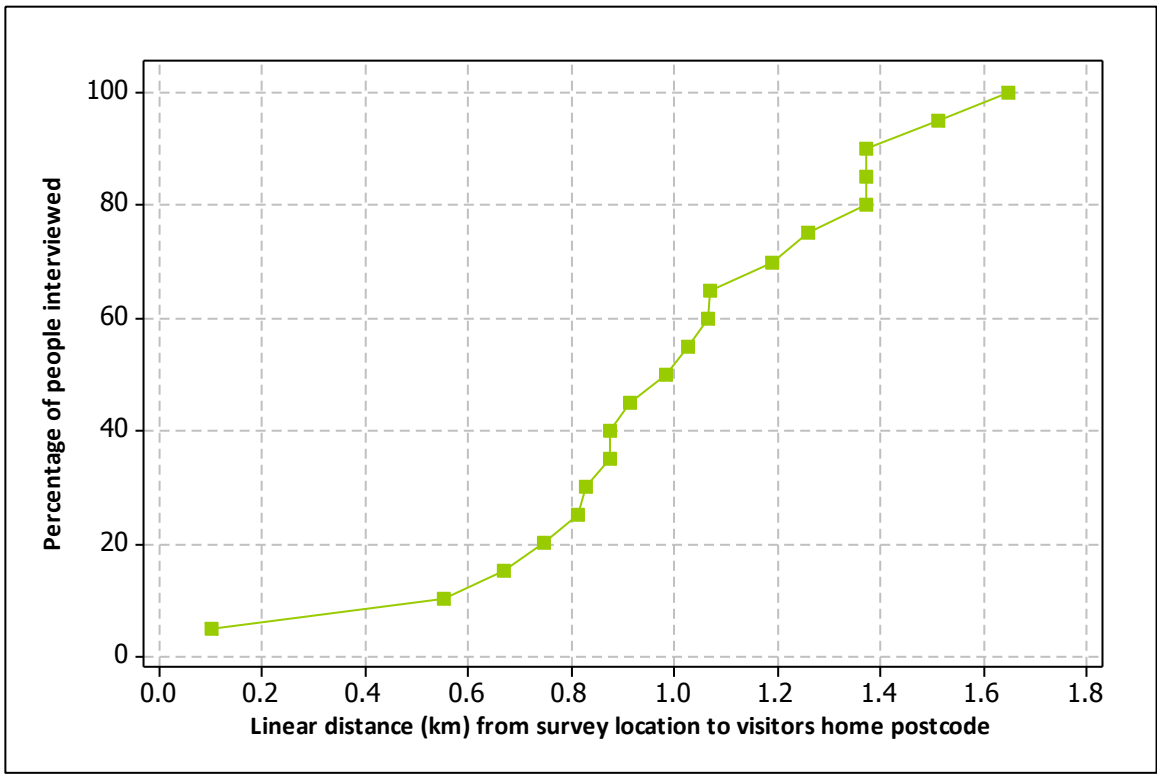


Figure 7: Cumulative frequency distribution of the linear distance from the interviewed visitors' home postcode to the survey location for those visitors who arrived on foot.

Relationship between the spatial distribution of housing and visitor numbers

4.43 In Table 13 we summarise the number of interviews conducted with residents from various key settlements in and around Forest Heath District and St. Edmundsbury Borough. It can be seen that Brandon and Bury St. Edmunds are the two locations that stand out, accounting for a large proportion of the residents interviewed in the two Districts. Both settlements are of course quite large.

Table 13: Total number of interviews (and the total number of people accounting for group size) conducted with residents from towns/villages in and around St. Edmundsbury and Forest Heath Districts

Settlement	Number of interviews	Total number of people
Brandon (Forest Heath)	23	56
Lakenheath	8	31
Mildenhall	2	3
Coney Weston	1	1
Thistley Green	1	5
Stanton	1	1
Culford	1	1
Bury St Edmunds	22	55
Great Barton	3	7
Fornham All Saints	1	1
Risby	2	6

4.44 To investigate possible relationships between the number of houses in and surrounding the Brecks SPA and the number of visitors to the area we consider how the interviewees are distributed within different buffer zones around all the survey locations.

4.45 Figure 8 shows the number of visitors recorded from the visitor monitoring and the distance they live from the location at which they were interviewed. A large number of visitors lived 2.5km and 4km from the SPA. Reasonably high numbers of interviewees also lived between 4km and 8km from the survey locations.

4.46 The number of residential dwellings within the same distance bands from the survey locations was also extracted (Figure 9). The distribution of visitors was compared to the spatial distribution of residential dwellings within the same distance bands. There is a low level of housing within 500m of all the survey locations. There is an increased level of residential dwellings between 1km and 3km which then drops before increasing at 5km. This mimics the resident distribution of visitors (Figure 7). The housing levels then remain relatively consistent until 24.5km when they steadily increase as the distance bands start to encompass major settlements.

4.47 It is likely that the limited number of visitors to the surveyed area who live within 500m is linked to the relatively low housing levels within 500m of the surveyed areas. However it is also possible that visitors living within a short walk of the SPA are less likely to visit the 'honey pot' sites (where monitoring was undertaking) preferring to spend their recreation time in quieter less visited areas. Housing and a preference for quieter locations could also account for the limited visitation from visitors living within 3km – 4km of the survey locations.

4.48 Approximately 90% of visitors by car lived within 50km (Figure 6) and 75% of within 25.2km (Table 12) of the survey locations. This indicated that despite the higher levels of housing within the further distance bands a lower proportion of residents are making the journey to visit the survey locations we monitored.

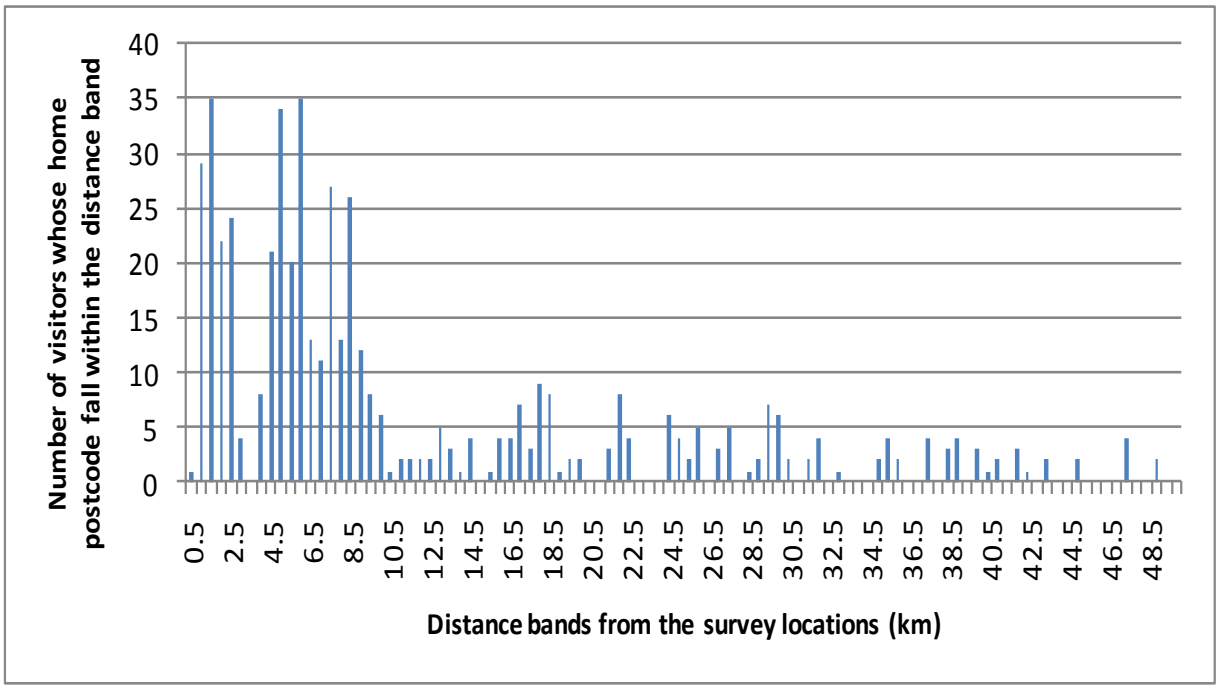


Figure 8. The number of visitors recorded at the survey locations categorised by the distance from their home postcode to the site they visited.

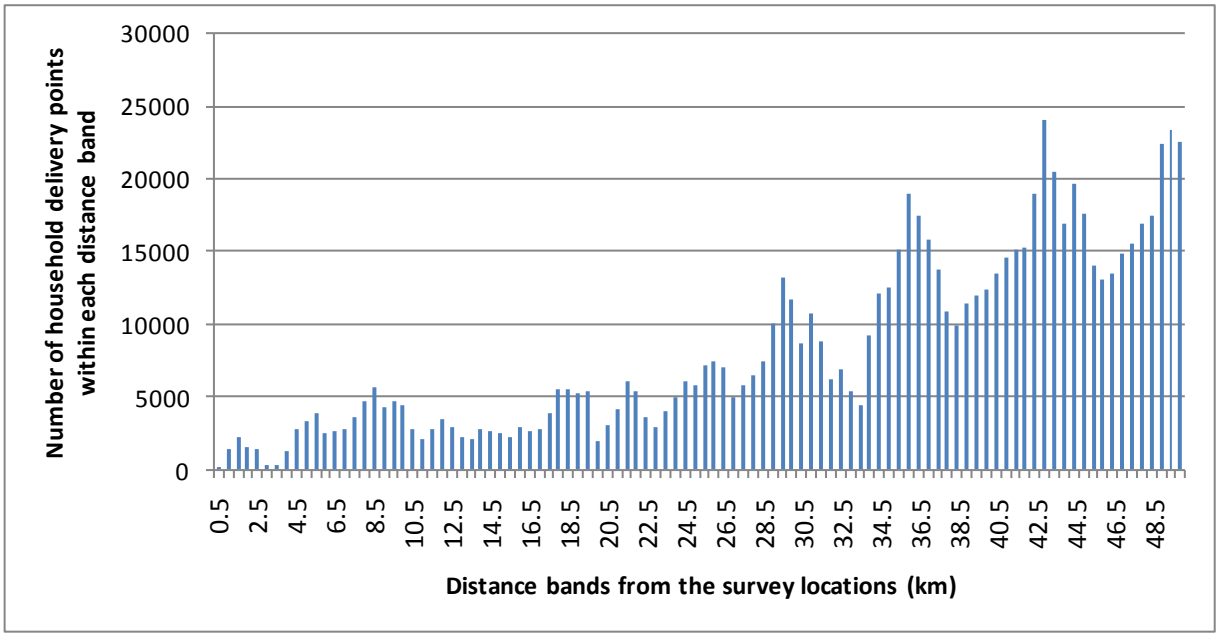


Figure 9: The number of residential dwellings within fixed distance bands of all survey locations.

4.49 Figure 10 shows the average rate of visiting a survey location in relation to the distance from home postcode to the survey location for locations where eight full survey sessions were completed (Table 2). High Lodge and West Stow Country Park are also included despite their six sessions as visitors were unable to visit and use these areas until the parks opened, thus we assume comprehensive visitor coverage.

4.50 All of the residents and all of the visitors were grouped into distance bands from the survey location, using bands of 500m divisions. For any particular distance band the visitation rate was calculated as the sum of all visitors (group size) to the 8 locations living within the distance band divided by the sum (across all locations) of the number of residents living within the distance band. The number of residents was calculated by multiplying the number of residential dwellings by 2.36[3].

4.51 The plot in Figure 10 appears to show a decreasing rate of visitation with distance, with some marked fluctuations. The fluctuations will be a result of relatively low levels of housing directly around the survey locations, such that small numbers of visitors (i.e. just one or two interviews) from these locations will be sufficient to have a marked influence on the observed visitor rates. It appears that rates after around 9km seem to change very gradually, but that residents in distance bands of around 0-9km seem to visit more frequently.

4.52 A simplified version of Figure 10 is shown in Figure 11, where data are grouped in 2km distance bands rather than 0.5km bands and a smoother trend is apparent and confirms an approximate cut-off as around 9km, beyond which visitor rates are low and relatively constant with distance.

[3] http://www.statistics.gov.uk/census2001/profiles/commentaries/housing.asp

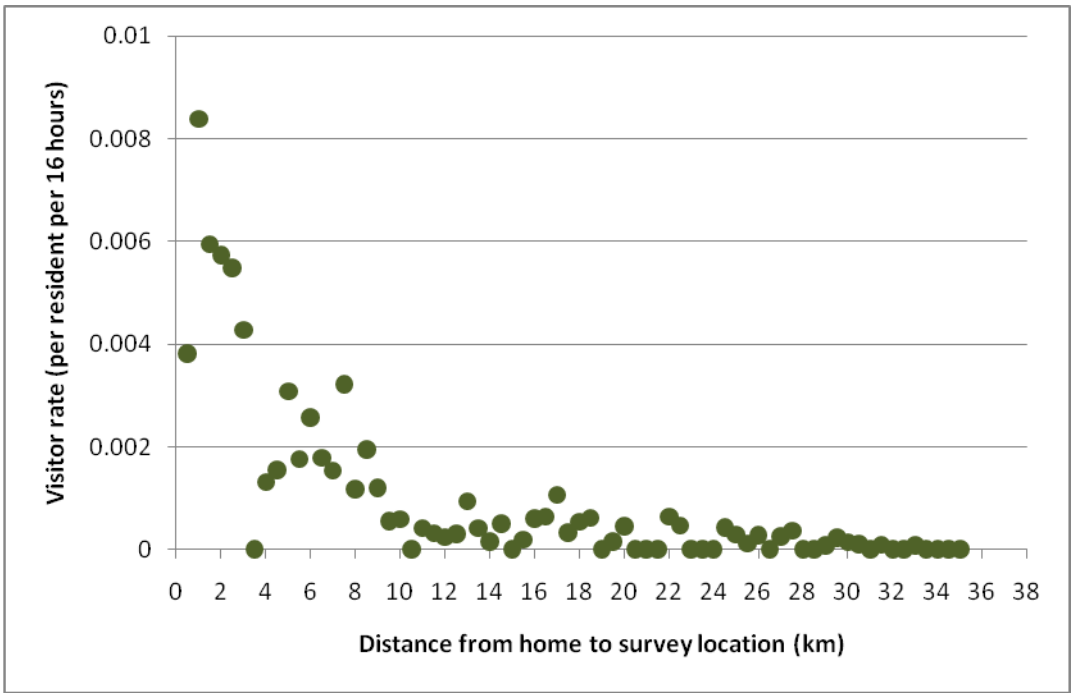


Figure 10: Overall average rate of visiting the 8 survey locations which were surveyed for the full 16 hours or during the country parks opening hours

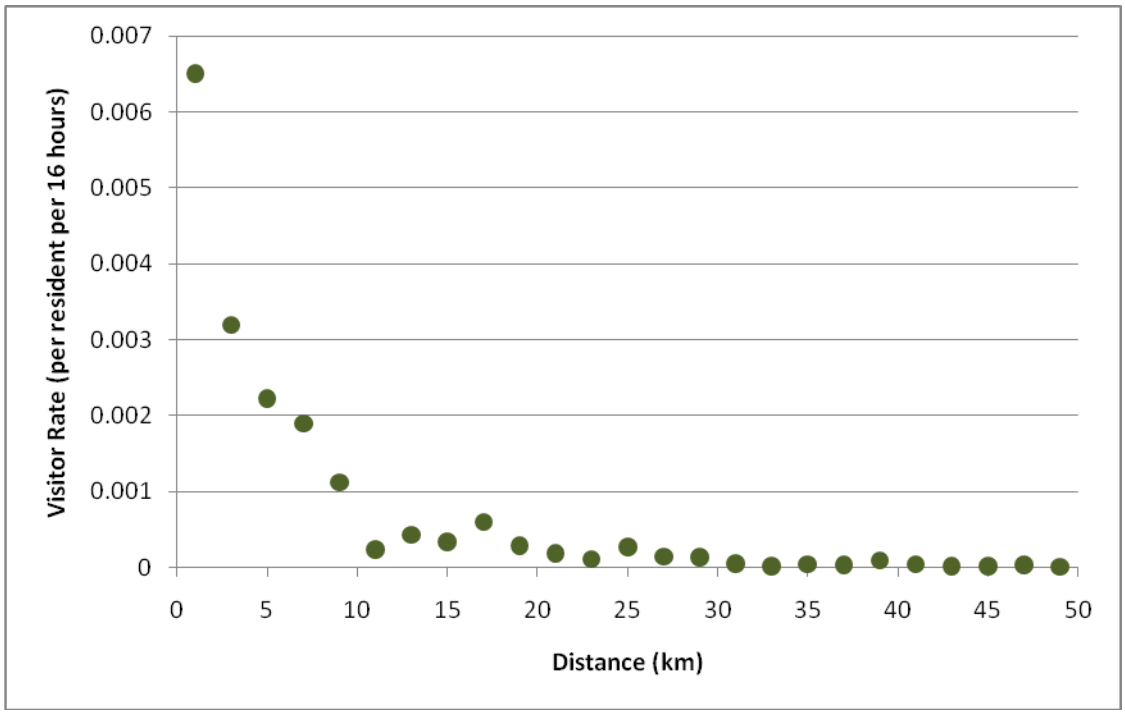


Figure 11: Visitor rates with distance (simplified version of figure 10, with data calculated for 2km distance bands)

Visitor routes

4.53 A total of 266 routes were collected from visitors representing 90% of all interviews. The routes were mapped as polylines within GIS and the total length of each route calculated. Excluding holiday makers, the data for 243 routes are summarised in Figure 12 and Table 14. There were significant differences between the different activities in the length of their routes (Kruskal-Wallis H = 110.08, 6 df, $p < 0.001$), with family outings involving the shortest routes (median 1810m) and cyclists travelling the furthest (median = 15.588m).

Table 14: Summary statistics relating to route length for each activity type excluding holiday makers (243 interviews).

Main activity	Number of responses	Route length (km)			
		Mean (SE)	Median	Minimum	Maximum
Dog walking	117	3.2 (0.3)	2.5	0.5	22.6
Walking	55	3.7 (0.4)	2.7	0.6	17.4
Exercise	4	11.2 (4.4)	8.9	3.2	23.8
Family	10	3.4 (1.2)	1.8	0.6	10.5
Cycling	50	16 (1)	15.6	2.3	31.40
Wildlife watching	11	2.8 (0.6)	2.6	0.5	7.8
Picnic	5	4.5 (1.6)	3.2	2.5	10.8

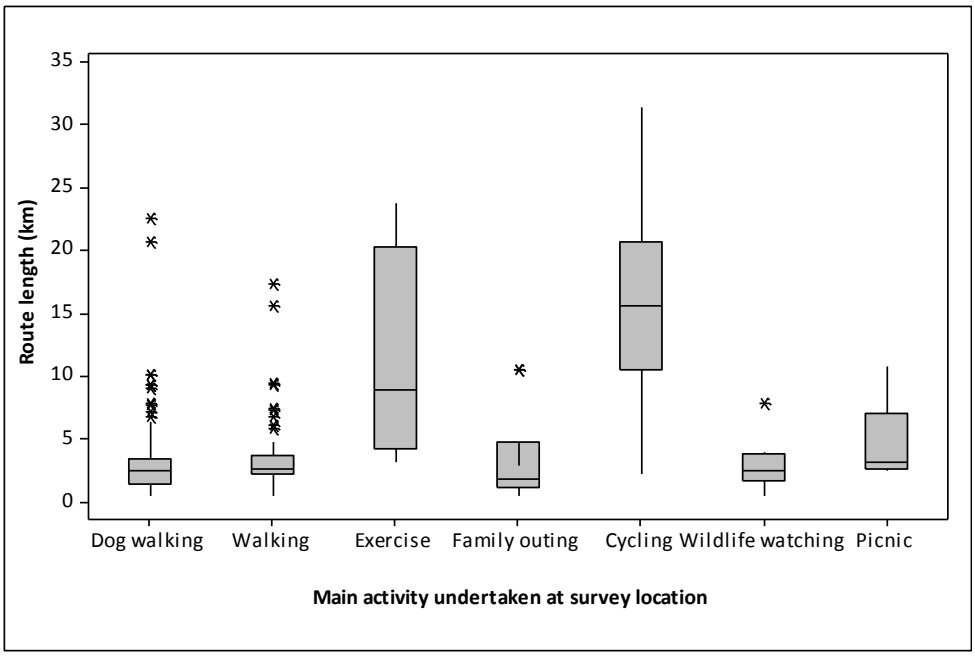


Figure 12: Boxplots showing route length data for each activity undertaken by non-holidaymakers. The plot shows the median (i.e. the mid point – represented by a horizontal line), and the interquartile range (i.e. 25 – 75% of the data – represented by a box), while the vertical lines show the upper and lower limits of the data, with outlying values represented by asterisks.

4.54 There was a significant difference between route lengths at the different survey locations (Kruskal-Wallis H = 90.42, 13 df, $p < 0.001$). Across all activities, the longest median route lengths were recorded whilst interviewing visitors at High Lodge Visitor Centre - Santon Downham (Table 15). Other locations where people tended to make longer routes included Brandon Country Park and Mayday Farm. Routes collected from visitors to Cranwich Heath, Emily's Wood and Lynford arboretum and water were amongst the shortest routes across all activities

Visitors were asked what factors had affected their choice of route taken during their visit. Multiple responses were accepted and excluding holiday makers, 123 responses were given which were coded into nine categories (

4.55 Table 16). A further 62 uncoded reasons influencing the choice of route were given by visitors. Across all responses the most popular factor influencing the choice of route was 'habit' (29%) followed by time available (25%) and then the weather (17%). More than 40% of dog walkers stated that habit influenced their choice of route. Time available was the most popular response from walkers.

Table 15: Median route length (km) for each survey location by activity.

Survey location	Main activity							
	Dog walking	Walking	Exercise	Family outing	Cycling	Wildlife watching	Picnic	All activities
1	1.5	2.6		0.6	5.3	2.3		1.6
2	1.6							1.5
3A	3.1	9.4		3.0				3.0
4	3.0	3.2	3.2				3.2	3.2
4A	2.8	3.7						2.9
5	3.3	2.7		1.7			10.8	2.8
6	2.1	2.6	23.8		20.8	3.8	2.7	4.6
7	8.0			10.5	10.5			10.5
8	3.8	6.2			10.2	7.8		7.6
9	2.6	2.1						2.3
9A	1.3			2.2		1.9		1.3
10	2.9	7.1	8.9		10.1	4.0	2.5	3.3
11	2.5	2.6		1.4		1.7		2.5
11A	2.8	2.6						2.6

Table 16: Numbers and (%) of responses for each category of factor influencing the choice of route taken during the visit as coded into eight categories and displayed by activity type undertaken. The most common factor influencing the choice of route for each activity is highlighted.

Factor affecting choice of route	Main activity							All activities
	Dog walking	Exercise	Walking	Family outing	Cycling	Picnic	Wildlife watching	
Habit	27 (42)		4 (11)	2 (2)	2 (10)	1 (25)		36 (29)
Time available	15 (23)	1 (50)	8 (22)	1 (1)	6 (30)			31 (25)
Weather	11 (17)		3 (16)	2 (2)		3 (75)	2 (33)	21 (17)
Followed marked trail	1 (1)	1 (50)	2 (11)	2 (2)	9 (43)			15 (12)
Other users	4 (6)				3 (14)		1 (17)	8 (7)
Wildlife	2 (3)						3 (50)	5 (4)
Forestry operations	3 (5)		2 (11)					5 (4)
Daylight	1 (1)							1 (1)
Muddy tracks/paths					1 (5)			1 (1)
Total	**64**	**2**	**19**	**7**	**21**	**4**	**6**	**123**

Visitor profile

4.56 A total of 15 interviewees (6% excluding holiday makers) considered themselves or someone in their party as having mobility difficulties. Four of these groups were recorded visiting Brandon Country Park and three were visiting Cranwich Heath. Other locations with one or two groups with mobility difficulties interviewed were Lynford arboretum and water, Two Mile Bottom picnic area, Two Mile Bottom - Alternative location, Mayday Farm, West Stow Picnic area, West Stow Country Park and Lynford Stag .

4.57 Over one third of under 18 year olds were recorded in groups interviewed at High Lodge Visitor Centre. Although the survey was conducted outside the school holidays there were 5 locations where no under 18 year olds were recorded: Emily's Wood car park, Two Mile Bottom- alternative location, Kings picnic area, Cranwich Heath, West Stow- alternative location (Table 17). Most visitors to the survey locations were between 18 and 65 years old except for Two Mile Bottom picnic area and West Stow- alternative location where the most frequently encountered visitor was over 65 years of age (Table 17).

Table 17: Number and (%) of visitors within each age group in groups interviewed at each survey location. The age group with the highest number of visitors at each location is highlighted.

Survey location	Number of visitors by age group				All visitors
	Under 18	18-40	41-65	older than 65	
1	3 (6)	23 (43)	10 (19)	18 (33)	54
2		3 (17)	13 (72)	2 (11)	18
3A	1 (13)	3 (38)	3 (38)	1 (13)	8
4	3 (8)	3 (8)	11 (28)	23 (58)	40
4A		1 (7)	7 (47)	7 (47)	15
5	9 (23)	13 (33)	12 (30)	6 (15)	40
6	1 (1)	67 (45)	58 (39)	22 (15)	148
7	24 (28)	44 (52)	14 (16)	3 (4)	85
8	2 (7)	9 (33)	10 (37)	6 (22)	27
9		1 (50)	1 (50)		2
9A			14 (64)	8 (36)	22
10	12 (18)	11 (17)	36 (55)	6 (9)	65
11	16 (21)	15 (19)	25 (32)	21 (27)	77
11A			1 (25)	3 (75)	4
Total	71	193	215	126	565

Other locations visited

4.58 Visitors were asked to list which other local places they visit for similar purposes, with a focus on the two or three that they visit most often. In total 389 responses were received from visitors (excluding holiday makers) which could be coded into 19 location categories. These responses are summarised in Table 18. The most frequently cited other location that people visited was High Lodge followed by Brandon Country Park. Dog walkers and walkers visited the greatest variety of other sites.

Table 18: Other local sites visited by interviewees (excluding holiday makers) and the total number and percentage of responses for each location. The most frequently cited location is highlighted within each activity group. Site names highlighted in orange are located in or within 50m of Breckland SPA.

Other locations	Main activity							Total responses (%)
	Dog walking	Walking	Exercise	Outing family	Cycling	Wildlife watching	Picnic	
High Lodge	22	19	2	2	19	3	2	69 (18)
Roundham	1	2						3 (1)
Methwold Common	1							1 (0.3)
Harling	4							4 (1)
Mildenhall Woods	4	6			1	1		12 (3)
Kings Forest	14	4			2	1		21 (5)
Croxton Forest	2	1			1			4 (1)
Hockham Forest		1						1 (0.3)
Brandon Country Park	22	13	1	5	11	4	3	59 (15)
Mayday Farm Bird Hide	3		1			1		5 (1)
West Stow Country Park	12	7		3	3		1	26 (7)
Emily's wood	4	1				1		6 (2)
Brettenham heath		2						2 (1)
Weeting heath	6	4				1		11 (3)
St. Helens Picnic area	12	4	1	2	1		2	22 (6)
Two Mile Bottom Picnic Area	16	1	1		1			19 (5)
Lynford Stag Picnic area	12	11	1		2	3	1	30 (8)
Lakenheath	3	5				2		10 (3)
West Stow Picnic Area	3	1				2		6 (2)
No other sites	29	17	3	7	17		5	78 (20)

Car park transects

4.59 Five car park transects covering 253 parking locations were undertaken as part of the visitor monitoring and Map 5 shows their location and capacities. In total the driving transects covered 2008 parking spaces.

4.60 The number of cars recorded on each transect varied. On all occasions at least 100 cars were recorded over the area in either car parks or laybys (Figure 13). No cars were counted at High lodge on the 02/07/2010 and 04/07/2010 as the park had closed.

4.61 A total of 1045 car were counted over the transects with an average of 209 cars. Sunday 04/07/10 had a higher number of cars recorded on the transect indicating higher levels of visitation to Breckland SPA, which fits in with the findings of the visitor survey that levels of visitation are higher at the weekends (section 4.14). On average approximately 10% of the available car parking spaces on the transects were occupied.

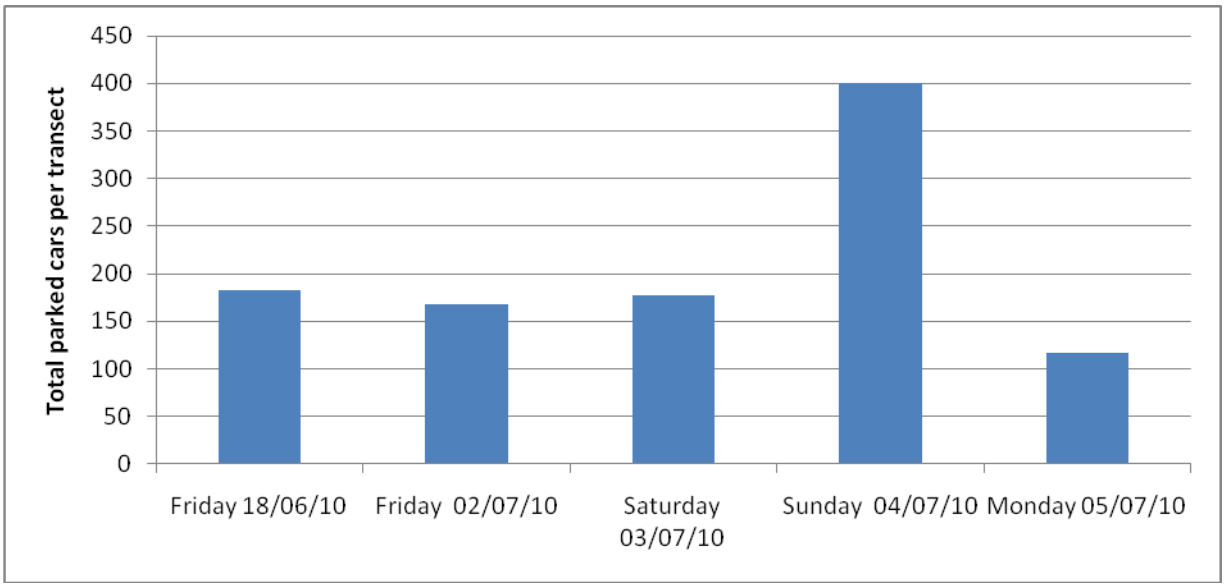


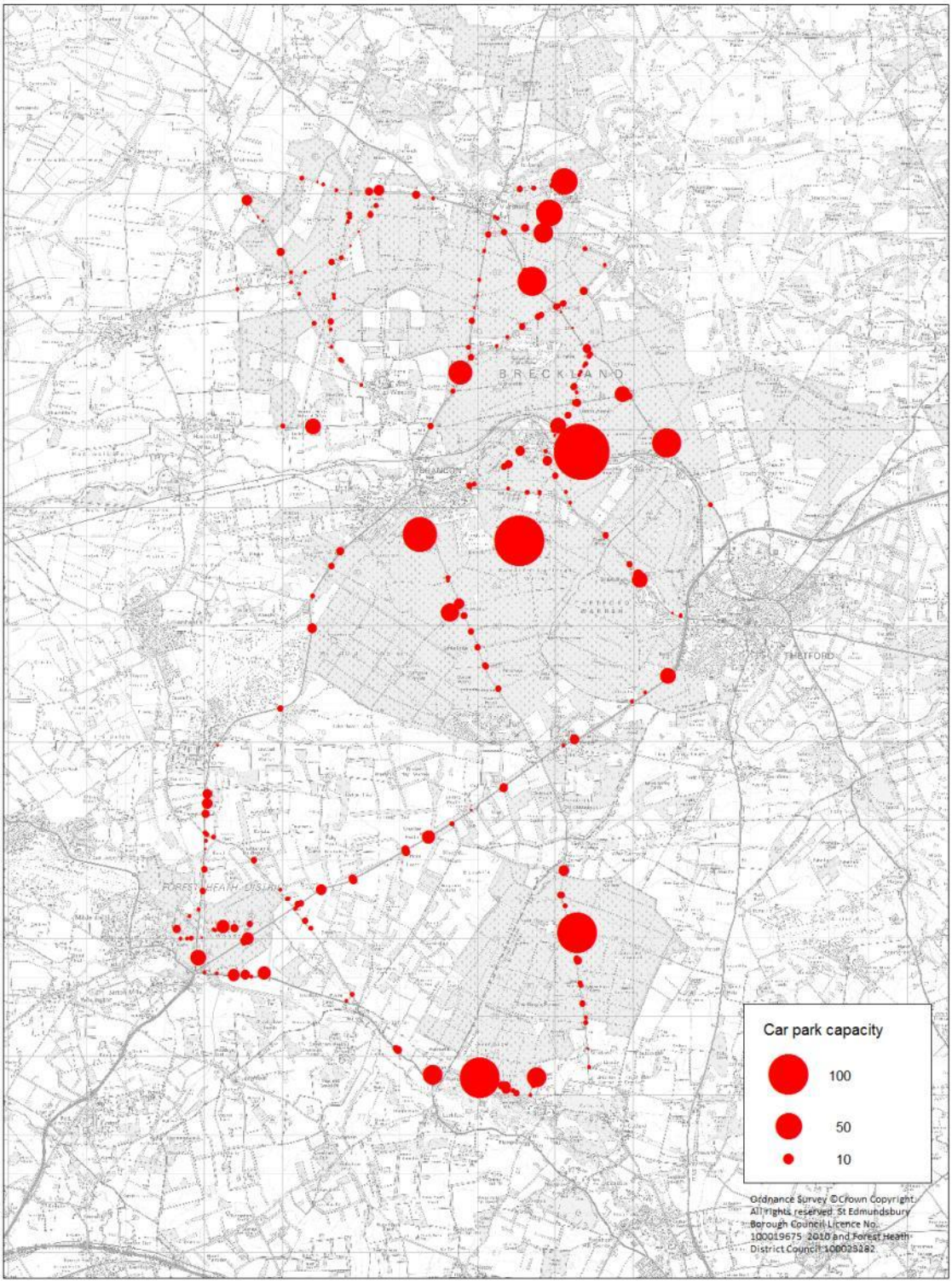
Figure 13: The number of parked cars recorded on each driving transect

4.62 The average number of vehicles recorded in each car park over the transect closely mirrors the capacity of each car park (Map 6). The main visitor centres (Brandon Country Park, West Stow Country Park and High Lodge, Lynford Stag and Lynford arboretum and water) and picnic areas (St. Helen's, Kings and Two Mile Bottom) with a formal provision of parking are those where consistently more cars were recorded.

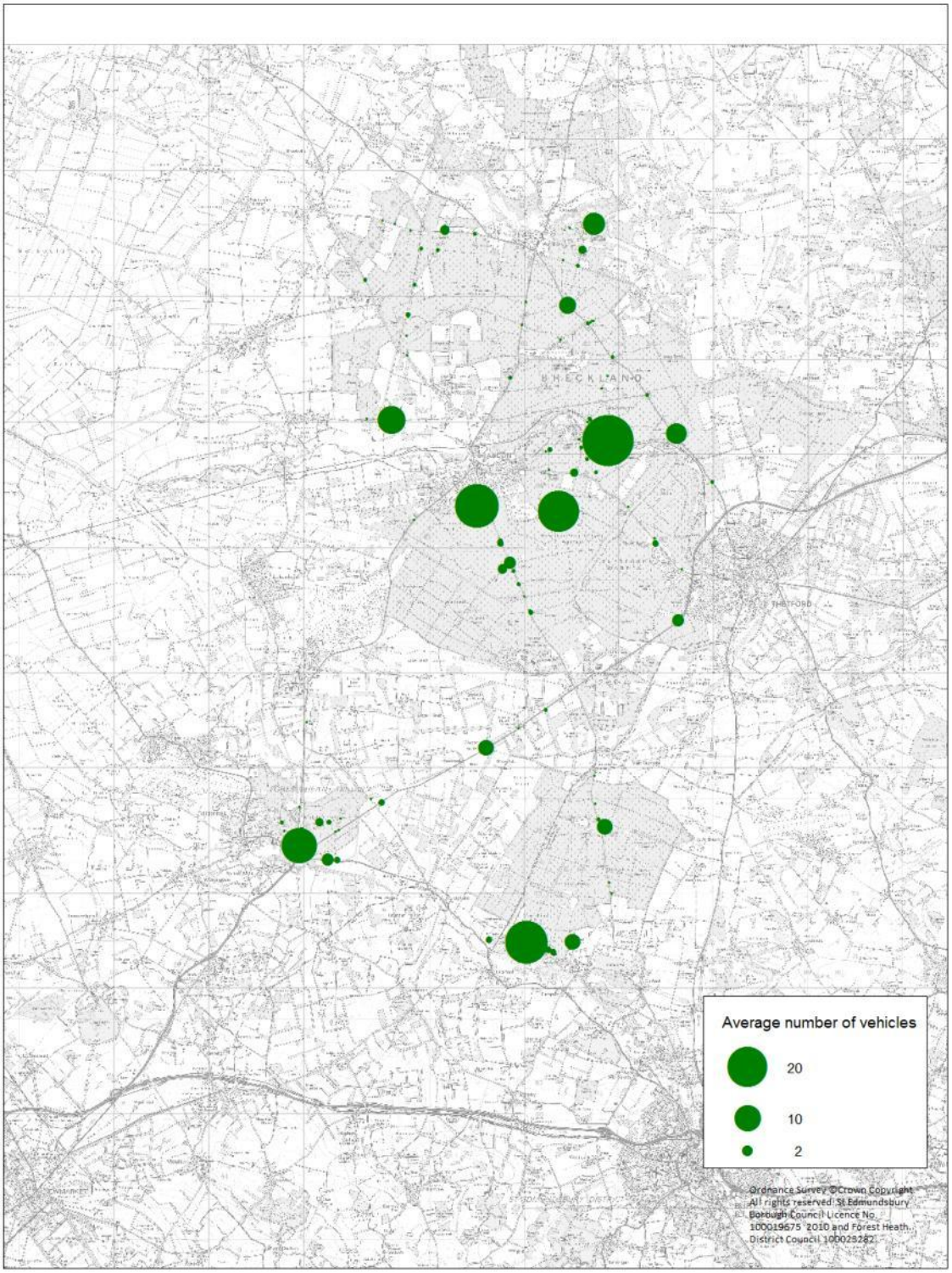
4.63 The highest numbers of cars were recorded at the locations with the highest car parking capacity and visitor surveys were conducted at all but two of these locations (Map 7). No monitoring was undertaken at the access locations adjacent to the picnic site car park near Mildenhall Woods. This site is just off of a busy road junction between the A11 and A1065 and visitors at this site are most likely those taking a rest break on a journey and unlikely to enter the SPA. Also no monitoring was undertaken at Weeting Heath national reserve where we assumed the visitors to this area are most likely

making a visit to bird watch from the hide. We are confident our survey locations targeted the 'honeypot' locations to maximise interview opportunities with visitors.

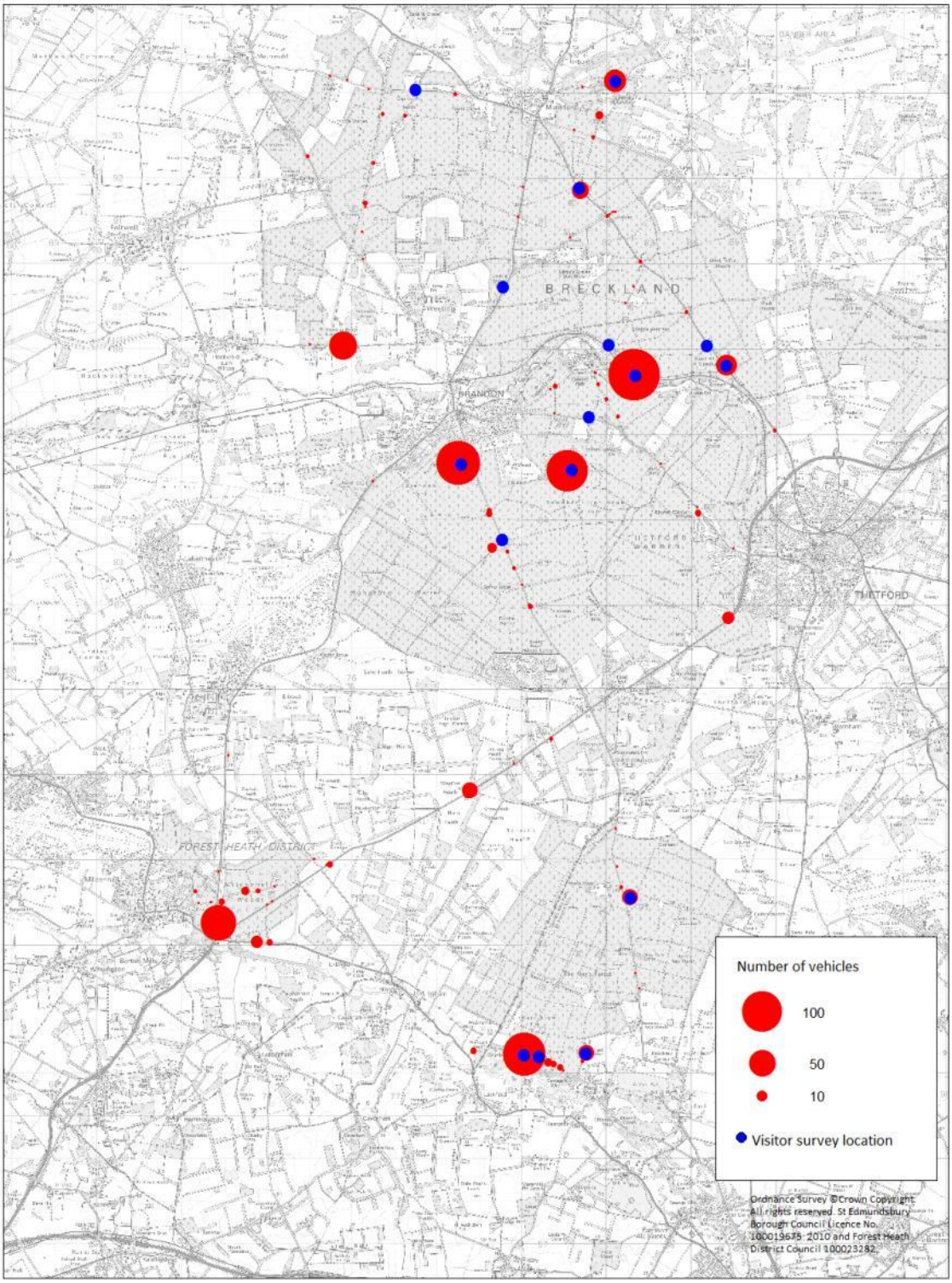
Map 5: Car park locations and their capacities included on the driving transects



Map 6: The average number of vehicles recorded per car park over five transects



Map 7: Total number of vehicles in each car park over all transects. Visitor survey locations are also shown.



5 Conclusions

A summary of the key findings from the visitor work which are of relevance in light of an increase in development within the catchment area of the SPA are presented in Box 1.

Box 1: Summary of the key findings from the visitor work

176 hours of visitor fieldwork with 297 visitor interviews were conducted.

Visitor numbers were significantly different between sites.

The majority of visitors (87%) had travelled from home and were local to the general area.

The local residents interviewed tended to visit frequently (i.e. at least weekly or daily) and throughout the year (47% indicated that visitation patterns were not influenced by seasonality). Slightly higher visitor numbers were recorded at weekends, but this was not consistent across all sites.

Visits were typically short, with 79% spending two hours or less.

Dog walking was the main activity undertaken (36% of local residents), with walking and cycling also popular. The proportion of visitors undertaking different activities varied between sites. Interviewees often chose to visit particular locations for their suitability to the visitors activity (31% interviewees), the proximity to interviewee's homes (25%) and a range of other reasons.

Just over 9 in 10 interviewed groups (91%) made their visit by car. Half of all interviewees that were local residents lived within 8.8km, and local residents included those living in a range of locations; the most interviews were residents of Brandon (23 interviewees) and Bury St. Edmunds (22 interviewees). Dog walkers tended to live closer to the sites where interviewed (half of all dog walkers lived within 5.6km of the interview location), wildlife/bird watchers (had a home postcode a median distance of 22.7km from the survey location) whereas cyclists (home postcode a median distance of 31.7km from the survey location) travelled the furthest.

Visitor rate declined with distance in that beyond 10km there was very little variation in visitor rates with increasing distance. At distances of less than 10km there was a relatively steep decline in visitor rates with increasing distance and that local residents make more visits the closer to the site they live.

Route lengths on site were recorded using maps and GPS units given to interviewees. Route length varied with activity, for example dog walkers typically undertook routes of around 2.5km whereas for cyclists the median route length was 15.6km.

Car-park transects were undertaken to assess levels of visitor use in the areas outside the forest blocks. Parking was concentrated in the forested areas rather than the open farmland surrounding the Forest, indicating that levels of access – at least from people driving from home – in the farmland areas may be low.

6 Implications for Strategic Planning

6.1 The results of the visitor survey provide valuable information and trends that is of assistance to local planning authorities taking forward local development documents and planning for future growth. Recreational impacts upon heathland sites and their wildlife, and the potential for those impacts to increase with future growth, has been the primary focus of Habitats Regulations Assessments of development plan documents in close proximity to the country's internationally important heathlands and forested heaths, including Dorset, the Thames Basin, and also the Brecks.

6.2 In accordance with the requirements of Article 6(3) of the Habitats Directive and Regulation 102 of the Habitats Regulations, Breckland Core Strategy Habitats Regulations Assessment considered housing density around the Breckland area. A comprehensive evidence base was used to underpin the assessment, including new research commissioned specifically for the Breckland Core Strategy Habitats Regulations Assessment. In comparison with other heathland SPAs elsewhere in the country where access has been shown to be an issue, the Breckland Core Strategy Habitats Regulations Assessment concluded that Thetford Forest is a large area, surrounded by relatively low levels of housing, and at present it seems apparent that recreational pressure may be adequately absorbed by the Forest. The Annex I heathland bird interest features are not yet indicating that they are negatively affected by the recreational disturbance, with the work undertaken on the breeding success of the Annex 1 birds showing no current impacts. However there are still some gaps in our understanding of the Thetford Forest populations of Annex 1 birds, their current status and potential changes that may be occurring. It is not currently understood whether distribution is affected by recreation, for example.

6.3 There is a considerable and continually growing volume of research indicating that there can be adverse effects to heathland Annex I bird species as a result of recreational disturbance. The Breckland Core Strategy Habitats Regulations Assessment acknowledged the need to be precautionary with regard to the current lack of evidence to indicate that the Breckland Annex 1 birds were being adversely affected by recreational disturbance. With a precautionary approach in place, in accordance with the precautionary nature of the Habitats Regulations, the potential for future impacts as a result of proposed growth was considered within the assessment, and recommendations made for future visitor management.

6.4 Taking into account the results of this visitor survey, it is advised that there is equally a need for a precautionary approach when considering the future growth proposals for both St Edmundsbury Borough and Forest Heath District. Furthermore, it is clearly in accordance with the requirements of Article 6(2) of the Habitats Directive to take a proactive approach to avoiding the deterioration of populations of species for which the SPA is classified, and the habitats upon which the bird interest features rely, before that deterioration is actually found to be occurring.

6.5 Spatial plans will set housing growth, and the proposed locations for that growth for a plan period that may be 15 years or more, with most Core Strategies currently working up to a date of 2026, for example. In order to ensure that the proposed growth will not result in an adverse effect upon European wildlife sites, either directly or indirectly, housing development in close proximity to such sites that are used for recreation should be thoroughly assessed for potential impacts, and appropriate measures to counteract the potential effects of increased recreational disturbance incorporated.

6.6 This visitor survey provides a range of findings that give an indication of both the location of development that may result in increased recreational pressure, and also some indications of what counteracting measures may need to consist of in order to effectively reduce recreational pressure on the SPA.

6.7 A key finding is that the majority of visitors are local residents (87%), living within a 10km radius. These visitors are coming to the Forest at least weekly, with many coming more frequently. People are therefore using Thetford Forest as their local greenspace. With a wider understanding of the research into recreational disturbance and its potential to adversely affect Annex 1 birds, this finding indicates that development within 10km is likely to result in increased access, and therefore potentially increased recreational disturbance. Any new housing within this radius should be identified as development that would be likely to have a significant effect as a result of recreational disturbance upon the SPA, in the absence of any counteracting measures and taking a precautionary approach. It is also likely that, the closer new housing is to the Forest, the greater the additional recreational pressure will be.

6.8 In the HRA for Breckland District Council Site Specific Policies and Proposals DPD[4], similar results are presented in relation to visitor rates with distance, but derived from a different data set (visitor data collected at points within the forest, rather than at access points and undertaken using a differen methodology). Considering the different approach, the results are similar – the data in the Breckland HRA appears to flatten out at around 7.5km, plotted from the edge of the Forest rather than the survey locations. Visitor rates also appear to be lower, which may be accounted for the survey locations (i.e. it is to be expected that more people will be interviewed at car parks, picnic sites etc rather than points inside the forest)

6.9 Spatial planning should consider the possibilities for diverting some of the recreational pressure away from the SPA and the key areas for birds. It should be recognised that forestry management inevitably means that different areas become important over time, due to the cyclical nature of the management. One option for deflecting visitors is the provision of alternative greenspaces that are at least equally, if not more attractive than the European sites. Such an approach could link into any green infrastructure initiatives as part of the local development frameworks. In designing an alternative recreational space for new development, important factors to consider are the distance

[4] See: http://80.82.124.74/sites/default/files/legacy_files/breckland_site_specific_hra__version_31st_may_2010.pdf

to travel to the site, the facilities at the site, and experience and feel of the site. This visitor survey has identified that people are travelling up to 10km to use the SPA as their local greenspace. The provision of an attractive alternative in closer proximity to a new development would increase its likelihood of use. Another key piece of information from the survey is the fact that 91% of visitors arrive by car. Provision of adequate car parking facilities at any alternative site is therefore of fundamental importance in ensuring its attractiveness and accessibility to visitors. This also implies that a reduction in car parking at sensitive SPA locations may reduce access at those points. Other information gathered, such as the typical length of walk, high volume of dog walkers and the specific interest in varied cycling routes of an adequate length, will also inform the facilities and experiences that need to be replicated on any alternative greenspace.

6.10 The survey revealed that the majority of visitors are using the 'honey pot' locations.. These 'locations have existing access infrastructure, for example Brandon Country Park is a designated country park based around an Edwardian villa. The grounds of the villa include lawns and a walled garden that can support high numbers of visitors without impacts to Annex I birds. Such sites have tourist information points, cafes etc and are could also be the focus of further enhancements, to increase their capacity for further visitors whilst diverting access away from sensitive locations important to the Annex 1 Birds. Joint working between the local planning authorities and partners such as the Forestry Commission will be beneficial in the pursuit of successful counteracting measures.

6.11 The current situation of relatively low visitor levels in comparison with other SPA heathland sites, and the current lack of ecological data to suggest that the Annex 1 bird interest features are adversely affected by the current disturbance levels, would potentially indicate that there is no current cause for concern. New development adjacent to the SPA may however result in increased access and future monitoring would be very beneficial. Part of the suite of counteracting measures to be built into local development frameworks could include both monitoring of visitor levels and activities as development comes forward, and also ecological monitoring of the Annex 1 birds to determine whether any further decline is apparent. As well as providing additional much needed data, this monitoring could act as an early warning system to trigger further counteracting measures to come forward with housing growth.

6.12 It is recommended that local planning authorities work in partnership, both in the assessment of potential effects, and also in a co-ordinated approach to providing measures to counteract the future effects of recreational disturbance. It may be necessary for Habitats Regulations Assessments to consider the in-combination effects of growth across districts and boroughs, where growth in one district alone is assessed as being insignificant.

7 Discussion

7.1 The results present a snap shot of recreational use across a range of locations within Breckland SPA. The survey locations consisted of informal parking with fewer facilities and access locations, picnic site and country parks. It is perhaps therefore not surprising that such variation in terms of visitor numbers, activities undertaken and motivations for visit was encountered

7.2 Antisocial behaviour was encountered at three locations and monitoring was moved to alternative survey areas. This meant that the number of survey sessions and hence survey effort was not consistent between the surveyed locations and so direct comparison of values between all of the sites should be avoided.

7.3 The visitor monitoring has showed that recreational use of the area varied according to the survey location. The country parks attracted the highest number of visitors and the locations with informal and less parking had a much lower numbers of visitors. What is clear is that Breckland SPA draws visitors from a wide radius – local and regional residents and holiday makers.

7.4 A number of clear patterns have emerged from the on-site visitor monitoring

- The number of visitors arriving on foot to the survey locations was low reflective of the low levels of housing adjacent to the SPA.
- The country parks had a higher number of visitors who came from a wider catchment area in comparison to the survey locations where there was restricted levels of parking. Visitor travelled furthest to High Lodge Visitor Centre with half of all interviewees travelling 24.7km.
- Visitors took longer routes during their visits at High Lodge, Brandon Country Park and Mayday Farm which is reflective of the cycling route available at these locations.
- The length of a visitor route varied with both survey location and activity.
- The highest percentage of visitors to High Lodge and Brandon Country Park were in the age group 18-40 and Emily's Wood and West Stow picnic area had the highest percentage of those aged 41-65.
- Dog walking, walking and cycling accounted for 76% of visitor activities in the area and dog walking was the most popular activity.
- Holiday makers account for 9% of all visitors interviewed.
- Half of all visitors by car lived within 9.5km of the survey location at which they were interviewed.
- The distance visitors travelled to visit a location are influenced by the activity they intend to do and the location they visit.

- The most popular days to make a visit to Breckland SPA were the weekends (with the number of visitors on a weekend day typically being around a third as much again as counted on a week day).

7.5 The visitor monitoring has helped us identify where visitors come from to visit the area, what activities they undertake, their motivation for visiting and frequency they choose to visit. This understanding of visitation patterns is fundamental to underpin access management and green infrastructure provisions around the region. Such measures are important to ensure any impacts from recreation to the SPA are avoided or effectively mitigated.

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9 Appendix 1: Visitor Questionnaire

Forestry Commission England

footprint ECOLOGY

St Edmundsbury BOROUGH COUNCIL

Forest Heath District Council

Brecks Visitor Questionnaire

Good am / pm. Please could you spare me some time to take part in a short survey about your visit today. The survey is being conducted for St. Edmundsbury Borough Council and Forest Heath District Council

Q1 Are you on holiday and staying in this area or visiting from your home? *Tick closest, single answer only*

	1 On holiday
	2 Visiting from home
	3 Other: note details below:

Q2 On average, over the past year, how often have you visited this area? By "this area" we mean Thetford/Kings/The Brecks and Mildenhall Forests? *Tick closest answer. Single answer only.*

	1 Daily
	2 Weekly
	3 Monthly
	4 Less than once a month
	5 Less than once per year
	6 Don't know / first time

Q3 What form of transport did you use? *Single answer only, tick as appropriate*

	1 Car
	2 On Foot
	3 By bicycle
	3 Other (write in)

Q4 If visitor arrived by car. Did you park in a car park today? *Please tick one and if yes,* **In which car park did you leave the car?**

No		Yes :

Q5 For visitors that arrived by car. When undertaking (insert visitor activity –walking, cycling) do you prefer to park in a formal car park as opposed to a layby or area around firebreaks? *Tick closest answer. Single answer only.*

	1 Always in car parks
	2 Leave the car in a car par most of the time
	3 No preference
	4 Rarely in car parks
	5 Never in car parks
	6 Don't know / first time visiting area

Q6 What is the main activity you are undertaking today? *No prompt. Multiple answers ok, tick as appropriate*

	1 Dog walking
	2 Walking
	3 Exercise (inc jogging)
	4 Outing with children/family
	5 Cycling
	6 Birdwatching / wildlife watching
	7 Picnic
	8 Other (write in):

Q7 How long have you spent / will you spend in the area ? *Tick closest, single answer only.*

	1 Less than 1 hour
	2 1 - 2 hours
	3 2 - 3 hours
	4 More than 3 hours

Q8 Do you tend to visit this area at a certain time of day? *Tick closest, multiple answers ok*

	1 Before 9am
	2 Between 9am and 12
	3 Between 12 and 3pm
	4 Between 3 and 5pm
	5 After 5pm
	6 No / Don't know / first visit

Q9 Do you tend to visit this area more at a particular time of year? *Multiple answers ok, tick as appropriate*

1 Spring		4 Winter	
2 Summer		5 Don't know / 1st visit	
3 Autumn		6 Same all year	

Q10 Aside from this location, do you visit any other places locally for similar purposes as you visited here today? *IF YES:* **which two or three do you use most often?** *Multiple answers ok. Do not prompt. Tick closest answers and add additional details at end.*

	1 No other sites		11 Two mile Bottom Picnic Area
	2 High Lodge		12 West Stow Picnic Area
	3 Kings Forest		13 Weeting Heath
	4 Hockham Forest		14 Lakenheath
	5 Brandon Country Park		15 Brettenham Heath
	6 Mayday Farm Bird Hide		16 Croxton Forest
	7 West Stow Country Park		17 Mildenhall Woods
	8 Emily's Wood		18 Methwold Common
	9 St. Helen's Picnic Area		19 Harling
	10 Lyndford Stag Picnic Area		20 Roundham

Additional details / sites / specific location:

Q11 What made you come here, specifically, rather than other local sites? *Multiple answers ok. Do not prompt. Tick closest answers as appropriate. Use free text box for reasons that don't fit with categories/ extra detail.*

	1 Don't know / others in party chose		9 Particular wildlife interest
	2 Close to home		10 Attractive scenery/views
	3 Short travel time from home		11 Good for activity (cycling/dog walking)
	4 Good /easy parking		12 Particular facilities at the site
	5 Feel safe here/safety issues		13 Good for dog/dog enjoys it
	6 Familiarity (with tracks/site etc)		14 Safe for dog to run off lead
	7 Choice of routes/ability to do different circuits		15 Habitat (e.g. amount of tree cover/open habitat)
	8 Not many people / quiet		16 Always visit this site / habit

Free Text: other reasons / detail. Draw out site specific features and note details here.

Now I'd like to ask you about your route today. Looking at the area shown on this map, can you show me where you parked (if travelling by car) and where you started your walk or visit today. And the finish point. And your route please - Did you follow one of the marked trails? *Probe to ensure route accurately documented. Use* **P** *to indicate parking,* **E** *to indicate start point and* **X** *to mark exit and mark route with a line. Use solid line for actual route and dotted line for expected / remaining route.*
TICK IF GPS USED INSTEAD: GPS NO: START TIME: RETURN TIME:

Q12 Was your route today a typical length for you? *Single tick only*

	1 Yes, normal			3 Shorter than normal
	2 Longer than normal			4 Not sure/visit erratically /first visit/no typical visit

Q13 What (if anything) influenced your choice of route today? *Multiple answers ok. Do not prompt. Tick closest answers as appropriate. Use free text box for reasons that didn't fit with categories/extra detail.*

	1 Weather		5 Time available
	2 Daylight		6 Muddy tracks/paths
	3 Followed a marked trail		7 Wildlife
	4 Other users		8 Forestry Operations / Management
			9 Habit

Free Text: other reasons / detail:

Q14 Does a member of your household have a? ***Please tick if yes.***

Discovery Pass for High Lodge from The Forestry Commission	
An annual car parking pass for Brandon Country Park from Suffolk Council	

Q15 Is anyone in your household a member of 'Friends of Thetford Forest'?

Finally, so that we can check whether we have a representative sample, please answer the following questions. This information will not be used for anything else.

Q16 What is your full home postcode?

If unable/refusal to give postcode: **What is the name of the nearest village/town?**

Q17 How many of your party fall into the following age categories? *Enter number*

	1 Under 18			4 41-65
	2 18-40			5 Older than 65

Q18 Do you or any of your party have any mobility difficulties? *Single tick only*

	1 Yes		2 No		3 Don't know / refusal

THAT IS THE END. THANK YOU VERY MUCH FOR YOUR TIME

SURVEYOR TO COMPLETE AFTER INTERVIEW FINISHED:

Questionnaire No.:	Gender of respondent (M / F):	Group size (total people):
Date:	Number of dogs:	Surveyor:
Time:	Dog(s) seen off leads? Y/N	Interview location
Location:	Interview conducted part way through route (tick if yes)	Accompanying map? (tick for yes, x for no):