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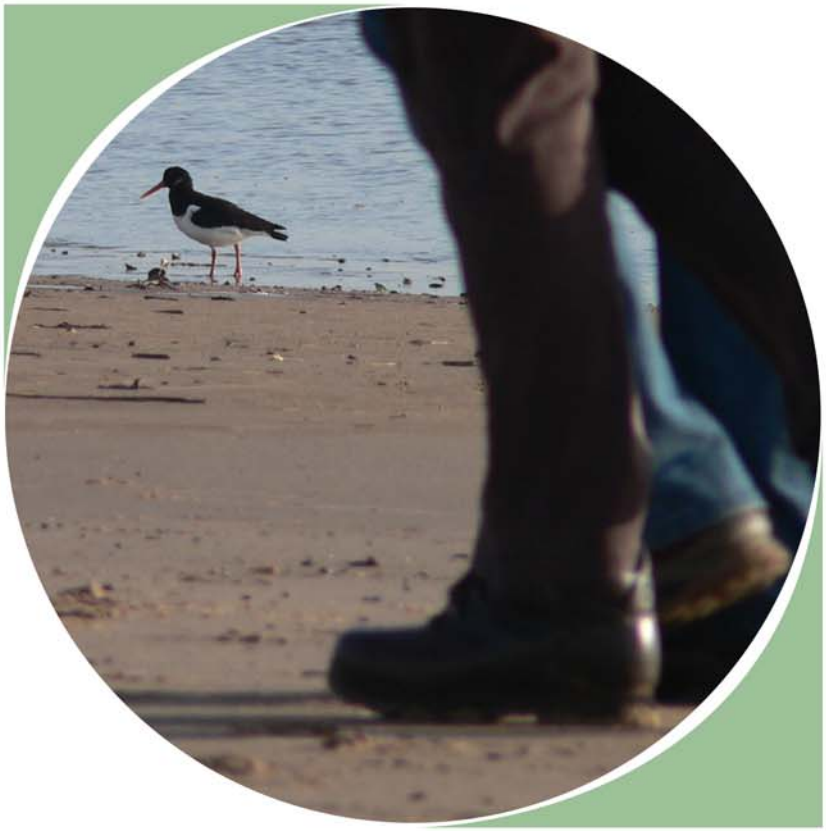
The Solent Disturbance & Mitigation Project

Phase II - On-site visitor survey results from the Solent Region



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Phase II – On-site visitor survey results from the Solent region

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Summary

This report sets out the results of the on-site visitor survey component of the Solent Disturbance and Mitigation project. The work was commissioned by the Solent Forum in response to concerns over the impact of recreational pressure on features of the Solent SPA, SAC and Ramsar Sites. Of particular concern are the cumulative impacts of recreational use arising from potential new housing developments in the Chichester District and South Hampshire.

The visitor surveys were conducted during the winter 2009/2010 to assess the level and type of visitor use at selected locations along the Solent coastline. Overall it is likely that the number of visitors interviewed and counted during the survey period was lower than would be normally be expected given the especially cold 2009/2010 winter. With that in mind, there is the potential that the monitoring could provide an underestimate of the absolute number visitors to the region. However, the interviews were designed to elicit generic and site specific details from visitors and although fewer individuals may have been recorded or interviewed because of the weather we can assume that the general winter visitation pattern remained similar and the results very useful in understanding who, where, when and why people use the coast.

Counts of people and interviews were conducted at 20 locations around the Solent coastline (including the north shore of the Isle of Wight). A total of 16 hours of surveys were carried out at each location, split equally between weekend (8 hours) and a weekday (8 hours). A total of 784 interviews were conducted, accounting for 1,322 people and 550 dogs. The average group size was 1.7 people.

There were differences in visitor numbers between survey locations, with the highest visitor numbers recorded at Emsworth (1088 visitors were recorded using the site over 16 hours) while Lymington (Boldre/Pylewell) was the least busy (33 visitors counted over 16 hours). Visitor numbers per day were typically highest on weekend compared to weekdays. Holiday makers accounted for 6% of the total number of visitors recorded (80 visitors). Visitors were undertook a wide range of activities, with walking (without a dog) and dog walking the two most frequently recorded activities (44% and 42% of interviews). Across all sites and activities, visits were typically short, with 89% lasting less than two hours. The main modes of transport used to reach sites were by car and on foot, with the proportion of people arriving by each mode varying between sites. Across all sites (and taking the data for non-holiday makers only), 51% of interviewees arrived by car and a further 46% arrived on foot. Home postcodes were used to identify the distance between interviewee's home and the location where interviewed. Half of all visitors arriving on foot lived within 0.7km, while half of all visitors arriving by car lived more than 4km away. Only 9% of foot visitors lived more than 2km away compared to 80% of all car visitors.

Linear regressions using housing numbers within different distance bands of a location as a predictor of visitor numbers for each location show a positive relationship between the number of houses within 1km, 3km and 5km and number of visitors entering each survey location. Car park capacity at the access points did not provide a good indication of the frequency of visitors arriving by car to each location. The relationship is more complex, future modelling of visitor rates travelling to locations by car should include potential road related parking (related to length of nearby roads around access points) in addition to official and off road car parking capacity around the access points.

Route data were also collected for each interview, with lines drawn directly on maps during the survey. These route data were analysed to determine which activities take place below Mean High Water Mark (MHWM) and how far different groups go out into the intertidal. Across all the interviews, 7% of the mapped routes did not go within 25m of MHWM and were therefore visitors who did not actually make it to the beach (in some locations the survey point was set inland, for example near to parking locations etc.). A further 78% were entirely within the band between 25m above and 25m below MHWM, indicating routes that remained at the top of the beach, on the seawall or similar. It was 14% of the mapped routes that went below 50m from MHWM, and these included a range of activities, for example bait diggers, dog walkers, joggers, cyclists and people out on a family outing.

The implications of the results for further modelling and in relation to the disturbance of birds on the European Sites are discussed.

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Acknowledgements

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Our thanks to the fieldworkers who endured long days in often very cold weather. Survey data was collected by Sarah Atkinson, Paul Levey, Miranda Green and Doug Whyte. Neil Gartshore helped coordinate the survey work. Jenny Goy and James Miller (both Footprint Ecology) entered the questionnaire data and the route digitising was done by Sarah Atkinson.

This report relates to the wider Solent work. In shaping our ideas and recognising how this fits with the other elements of the Solent Disturbance and Mitigation Project our thanks go to Richard Stillman (Bournemouth University) and Katie Cruickshanks (Footprint Ecology).

1 Introduction

Overview

1.1 This report provides results of on-site visitor surveys conducted over the winter 2009/10 along the Solent shoreline, including the north shore of the Isle of Wight, Portsmouth, Chichester and Langstone Harbours. The visitor results are part of a series of studies – the Solent Disturbance and Mitigation Project – aimed at developing models of visitor access patterns and bird disturbance. These models will provide a strategic view of development, making the links between houses, visitor numbers (and behaviour) and disturbance to birds on European Protected Sites.

The links between housing, access and nature conservation impacts

1.2 A real and current issue for nature conservation in the UK is how to accommodate increasing pressure for new homes and other development without compromising the integrity of protected sites. There is now a strong body of evidence showing how increasing levels of development, even when well outside the boundary of protected sites, can have negative impacts on the sites. The issues are particularly acute in southern England, where work on heathlands (Mallord 2005; Underhill-Day 2005; Liley & Clarke 2006; Clarke, Sharp, & Liley 2008; Sharp et al. 2008) and coastal sites (Saunders et al. 2000; Randall 2004; Liley & Sutherland 2007; Clarke et al. 2008; Liley 2008; Stillman et al. 2009) provides compelling indications of the links between housing, development and nature conservation impacts.

1.3 The issues are not, however, straight forward. In the past access and nature conservation have typically been viewed as opposing goals (Adams 1996; Bathe 2007) to the extent that nature reserves often restricted visitor numbers and access (e.g. through permits, fencing and restrictive routes). It is now increasingly recognised that access to the countryside is crucial to the long term success of nature conservation projects and has wider benefits such as increasing people's awareness of the natural world and health benefits(English Nature 2002; Alessa, Bennett, & Kliskey 2003; Morris 2003; Bird 2004; Pretty et al. 2005).Therefore, there is the potential for conflict where high human populations occur alongside areas of conservation importance, particularly where there are existing rights of access to those sites. It is likely that numbers of houses in an area will correlate with the number of people living there, and that the number of local residents will be closely linked to the number of visitors at a site. Increasing the amount of housing potentially will lead to increased population and therefore increased access. The issues are often particularly acute in coastal areas, as the coast will always have a strong draw for visitors and the areas attractive to people and wildlife tend to coincide along a narrow strip of land around the water's edge. Often managing increased development, the provision of access and maintaining the nature conservation interest involves a balancing act.

1.4 The impacts and issues are complex and researchers tend to focus on the ecological or theoretical implications of their research and avoid making practical recommendations. While there is a large body of scientific and grey literature addressing the impacts of

access in coastal environments, and a number of reviews on the effects of access are available (for example see (Hockin et al. 1992; Nisbet 2000; Saunders et al. 2000; Kirby et al. 2004; Woodfield & Langston 2004a, b; Penny Anderson Associates 2006; Lowen et al. 2008; Stillman et al. 2009) these rarely provide detailed guidance to inform policy or planning. It is often difficult for conservation practitioners or policy makers to fully understand the implications of the research, let alone see a plan or project through appropriate assessment or understand the practical measures necessary to avoid adverse effects on the integrity of a site.

1.5 A detailed understanding of the recreational use of sites is clearly therefore important to underpin strategic planning and policy, particularly where there are development pressures around European Protected Sites. The spatial patterns of recreational access (both on the water and on the shore) and other disturbance (commercial shipping, industry, military training etc) are also critical to reaching a full understanding of access issues. In particular the relationship between access and development (e.g. how housing relates to access) is often the missing piece in the jigsaw as few ecologists are interested in such issues (but see Clarke et al. 2006; Liley & Clarke 2006; Liley, Sharp, & Clarke 2008).

The Solent

1.6 This study is concerned with the visitor pressure along the Solent shoreline between Hurst Castle and Chichester Harbours, including the north shoreline of the Isle of Wight. This stretch of coast totals some 250km. The shoreline includes a range of habitats that include wide sandy beaches, shingle beaches, mudflats, saltmarsh and developed habitats (docks, marinas etc).

1.7 There are currently 1.7 million residential properties within 50km of the shoreline with 600,000 residential properties lying within 5km of the shoreline. The housing allocations within districts bordering the Solent's international important wildlife sites total 100,000[1]. This is likely to generate an increase to the resident population (assuming housing occupation density does not decrease substantially) and hence the leisure use of the Solent shoreline. Most of this coast has access of some sort ranging from way marked routes and long distance paths to informal, de facto access and is used for a range of recreational activities encompassing a variety of water sports, walking, horse riding and nature watching (refer to Stillman et al. (2009) for review).

1.8 The coastline also contains a number of sites of international importance for nature conservation. The relevant European Protected Sites (see Stillman *et al.* 2009 for detailed accounts) include the Solent and Southampton Water Special Protection Area (SPA), Chichester and Langstone Harbours SPA, Portsmouth Harbour SPA, Solent and Isle of Wight Lagoons Special Area of Conservation (SAC), the Solent Maritime SAC, Chichester and Langstone Harbours Ramsar, Portsmouth Harbour Ramsar and Solent and Southampton Water Ramsar.

[1] http://www.southeast-ra.gov.uk/southeastplan/plan/view_plan.html

Solent Disturbance and Mitigation Projects

1.9 This report presents the findings from on-site visitor surveys along the Solent Shoreline and is one element of the Solent Disturbance and Mitigation project. The Solent Disturbance and Mitigation project involves a series of different pieces of work which when considered in unison will show the extent to which different scenarios of new housing in a wide area would impact the wintering bird populations.

1.10 Phase I of the Solent Disturbance and Mitigation project consisted of a desk based research study to describe and quantify the nature and scale of recreational disturbance impacts on coastal features of national and international importance in the Solent with particular reference to designated birds and their supporting habitats and designated habitats. The findings of Phase 1 detailing the wintering bird interest of the three SPA's across the Solent are in Stillman et al. (2009).

1.11 Phase II of the project involves developing two parallel predictive models which can be combined. On site visitor surveys and a postal survey to residents of the Solent will be used to model visitor rates and patterns across the shoreline. The surveys will look to quantify and assess current visitor numbers and activities across the Solent and the model will consider how visitor rates will change over time with proposed housing developments. In parallel with the visitor model, bird behaviour will be modelled in relation to disturbance events and an individual based behaviour model will be used to explore the impacts of disturbance on the number of birds that selected areas can support. The visitor and bird models will then be combined to investigate the impacts of visitor pressure on the survival rates of shorebirds. This report contains the results of the on-site visitor survey.

1.12 Phase III of the Solent Mitigation and Disturbance project will consider how mitigation measures could be used across the Solent shoreline to influence visitor rates and behaviour to limit any impacts of increased housing on the wintering birds of the SPA. Phase III has not yet commenced.

Aims and Objectives

1.13 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 along the shoreline. Visitor data are necessary not only to feed into bird disturbance predictive models but also to understand visitor patterns and motivations of individuals visiting this wide stretch of coastline. This information will allow us to identify the sections of coast with the greatest pressures and determine how far visitors are travelling to the shoreline. We can then consider how they use the coast, how long they spend and their motivation for the visit. This visitor information will allow us to evaluate how the Solent shoreline is currently used by local residents and visitors and provide information necessary to inform strategic development planning.

1.14 The on-site visitor data, combined with household survey data, will be used to derive predictive models to identify how and where along the shoreline visitor pressure is likely to increase in response to the increase in housing density. These visitor models

will link with bird models to allow the impact of recreation on the wintering bird populations to be determined. The level and type of visitor pressure is likely to differ between the patches of coastline. The detailed visitor monitoring is an important element of the project as it will allow us to identify exactly how each stretch of shoreline is used for recreation. We can then recommend localised mitigation measures considering both general and site specific visitor behaviour.

Methods

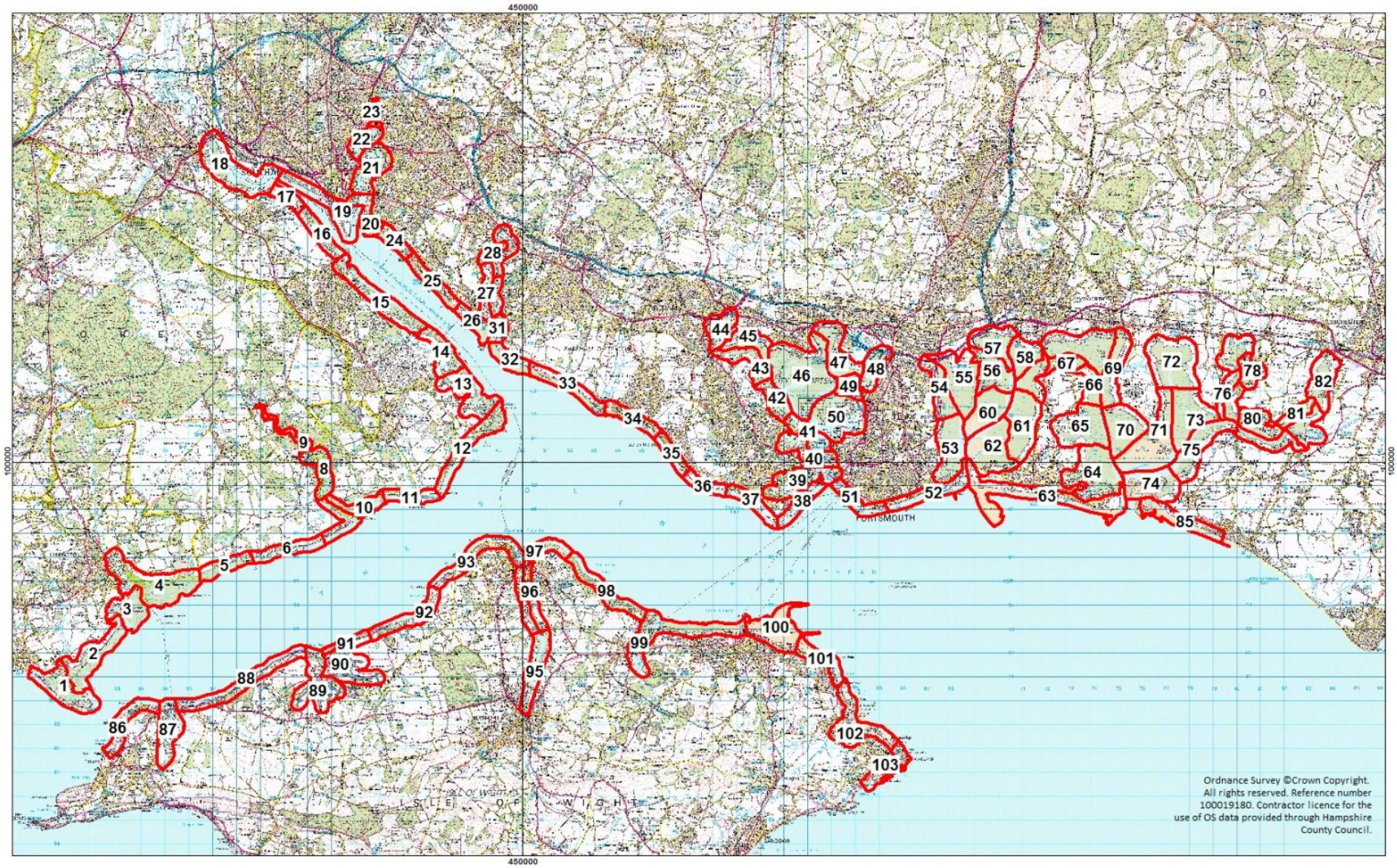
1.15 The visitor and bird data collection were carefully co-ordinated and designed to undergo comprehensive and parallel analysis. This report only details the methodology and results from the 'on site' visitor monitoring element of the project. The methodologies for the bird and disturbance monitoring are in a separate report

Identification of Survey Sites

1.16 The entire Solent shoreline was broken into discrete patches, based loosely on WeBS boundaries. It was possible to combine like WeBS patches to produce a series of patches which was representative of discrete units in terms of access and/or habitat. Map 1 shows the resultant boundaries of discreet patches which represent single units in terms of habitat or access locations. Twenty patches were selected for bird and visitor monitoring work over Winter 2009/2010. Visitor monitoring locations and bird survey points were not in exactly the same locations, but were within the same discrete 'patch'. The visitor work focussed on the main access point to a location to ensure exposure to as many visitors as possible. These access points were typically car-parks. Each survey location was named according to the nearest town; the actual grid references of each survey location can be found in Table 1 and these should be used to determine the precise locations of our visitor surveys. The names of survey locations are detailed in Table 1 and this report uses these names as reference to the visitation patterns of each access point. The bird surveys were conducted from locations that provided a good vantage point and site line of the birds (typically along the sides of a bay, or a headland where it is possible to look into the middle of the bay). The visitor monitoring locations are detailed in map 2.

Map 1: The division of the Solent coastline into sections. Visitor monitoring was conducted in 20 of these patches over Winter 2009 / 2010.

Section number



Map 2: The location of visitor survey points along the coastline. The legend number corresponds to the coastal section in Map 1.

Visitor surveys

1.17 The visitor survey work focussed on people counts and interviews with a random sample of visitors. Counts and interviews were conducted at carefully selected sample points, to capture the range of recreational use believed to occur within each section. The surveyor undertook the counts and interviews in two-hour sessions, spread over a day (07:30 – 09:30; 10:00-12:00; 12:30-14:30; 15:00-17:00). This collected eight hours of survey information on each day for each section monitored. Visitor pressure was consistently recorded across all sites and sections between dawn and dusk. This methodology allows direct comparisons between visitor patterns across survey locations and also provided the surveyor with breaks.

1.18 Each location was surveyed for two whole days -a full day on both a week day and a day over a weekend. In total 320 visitor monitoring hours over forty days were completed between December 2009 and February 2010.

1.19 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. The sample of people interviewed was randomised through the surveyor approaching all people leaving (as long as they were not already interviewing others). 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 and wore high visibility jackets.
- 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.
- All surveyors read a risk assessment and carried a mobile phone at all times. The police were notified in advance of the presence of our surveyors.
- We aimed to avoid days with inclement weather and incorporated some flexibility into the fieldwork to allow for such days.

1.20 The questionnaire was reasonably brief and the survey was designed to capture the following visitor information (a copy of the questionnaire (figure 16) can be found in Appendix 1):

- 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 travelled on site
- Visitor profile: age, employment status etc.
- Home postcode and whether a local resident or visiting tourist

Visitor postcodes

1.21 The distance between each visitors home postcode and the access point of the site they visited was analysed to provide an indication of the spatial distribution of visitors. The visitor data consists of the group size of each interviewee reflecting the true number of individuals represented by the visitor surveys. Each interviewed visitor to the Solent was asked for the full postcode from which they had travelled. GIS (MapInfo Professional v10.0) was used to geocode (plot) each postcode location so the distance each group of visitors travelled to the access points could be calculated. Postcodes from the interview data were geocoded using a standard Royal Mail postcode database (Postzon™ 100 data).

Car park spaces and road length

1.22 The location of car parks within 1km and 5km of the surveyed access locations were identified from aerial photographs on Google Earth. These Google Earth images were also used to estimate the number of spaces within each car park.

1.23 The road length available for parking was calculated using Routeware and MapInfo v10.0. Only the length of single carriageway roads was estimated and this was used as an approximate measure of the potentially-available level of road side parking.

Shoreline and intertidal routes

1.24 Information on people's routes was collected using maps in the field, with the interviewer probing the interviewee about their route and showing the interviewee the map. Routes were drawn as lines on the map, individually cross-referenced to each questionnaire. These data were subsequently entered into a GIS as polylines. Within the GIS (MapInfo v10.0) these were then summarised to give a total length of route. The amount of the route within the intertidal was also calculated. Buffer intervals around the mean high water mark (MHWM) were used to identify which visitors travelled across the shoreline and the intertidal areas during their route. Of those visitors who did walk/cycle along the shoreline and intertidal area the distance of their route in each intertidal zone was calculated. The buffers were created at 25m (which included 25 metres above the MHWM and 25 metres below to absorb any errors in digitisation of the route), 50m, 75m 100m, 150m 200m 250m & 500m. The 50m to 500m buffers were only created below the MHWM and are referred to as the intertidal zone. We assumed that routes or parts of routes within the 25m MHWM buffer zone (a 50m distance band with 25m above the MHWM and 25m below) did not cause any disturbance events. Routes within the 25m MHWM buffer were likely to be from visitors walking along sea walls, coastal paths or other tracks and for the purpose of this study we are interested in identifying the number of visitors that enter the intertidal

zones. For visitor routes which entered the intertidal zones the number of visitors, dogs, type of activity and the length of routes is calculated.

Data and Analysis

1.25 Data analysis was conducted using Minitab (v14). Unless otherwise stated all errors are standard errors. Box plots are used throughout the report to graphically present data for different groups. These plots show 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.

2 Results

Visitor Numbers & Overview of Data

2.1 A total number of 784 interviews were conducted which represents visitor information from 1322 visitors with 550 dogs across all the sample locations (Table 1). The average group size of visitors across all location was 1.7 +/- 0.04 and this value varied between the survey locations with some locations being more popular with larger groups of visitors (families) and others were more popular with single visitors. The highest number of visitors was recorded along the Promenade at Emsworth (137 people in the groups interviewed) and the lowest number of visitors was noted at the location near Lymington (Boldre/Pylewell) (20 people in the groups interviewed). The largest number of interviews was conducted along the Promenade at Emsworth and least number of interviews at the site near Lymington (Boldre/Pylewell).

2.2 There was a significant difference (χ^2_{19} = 287.4, P<0.001) in the number of visitors recorded at each location which indicates that visitor numbers and hence visitor pressure is not consistent between the sites.

2.3 The number of visitors entering all survey locations totalled 4,341 and those entering and leaving all survey locations totalled 5,307 with 1701 dogs, as visitors were recorded entering and leaving the site these values could include double counts of those visitors who entered and left the site during the survey period. The visitor monitoring interviewed approximately 21% of the total number of visitors to the sampled locations. There was a significant strong correlation between the number of visitors to a location and the number of interviews conducted (Pearson's correlation co-efficient, r= 0.784 at P<0.001) which confirms that more interviews were conducted at sites with higher numbers of visitors indicating a good level of monitoring consistency not just between surveyors but also between sites . At busier locations such as Ryde, The Promenade (Table 1) only a small percentage of the total number of visitors were interviewed. This is to be expected as there is a maximum number of visitors that a single surveyor can interview in a day. The total number of people using the sites at Ryde, The Promenade at Emsworth, Hilsea, Salterns Park, Salterns Quay, Alverbank East and Western Shore were recorded as it was too busy to specifically note which visitors were entering and leaving each site. The tally totals for these sites will not include any instances of double recording visitors.

2.4 The average interview refusal rate for the entire monitoring period was 9% and varied between sites. The high interview refusal rate of 49% at Hilsea is probably reflective of the use of the site by commuters and cyclists who were not prepared to stop for an interview.

Holiday makers accounted for 6% of the total number of people (accounting for group size) recorded from the visitor surveys and 41 holiday makers were interviewed during the monitoring.

Table 1: Summary statistics from the visitor monitoring of 20 Sections along the Solent shoreline during Winter 2009 / 2010.

Section	Site name	Grid reference of survey location	Number of interviewed visitors	Number of visitors in interviewed groups	Mean interviewed group size	Number of dogs with interviewed groups	Number of dogs per interviewee	Number of people recorded entering and leaving or using the site (see section 2.3)	Number of dogs recorded on site	Percentage of interview refusals	Percentage of dogs recorded on interviews	People interviewed as percentage of those using the site
4	Lymington (Boldre/Pylewell)	SZ 3470 9516	10	20	2.0	4	0.4	33	7	9%	57%	30%
12	Calshot	SU 4854 0165	21	40	1.9	8	0.4	169	32	22%	25%	12%
18	Eling	SU 3680 1256	31	44	1.4	31	1.0	130	92	11%	34%	24%
24	Weston Shore	SU 4459 0944	47	91	2.0	29	0.6	255	53	32%	55%	18%
26	Hamble Spit	SU 4786 0610	42	61	1.5	37	0.9	134	53	11%	70%	31%
32	Hookwith Warsash Nature	SU 4979 0430	56	78	1.4	46	0.8	216	92	3%	50%	26%
34	Salterns Park	SU 5465 0186	72	119	1.7	32	0.4	454	228	6%	14%	16%
37	Alverbank East	SZ 5914 9868	64	116	1.8	26	0.4	401	71	23%	37%	16%
44	Salterns Quay	SU 5805 0521	39	48	1.2	50	1.3	129	120	25%	42%	30%
48	Hilsea	SU 6479 0388	46	70	1.5	37	0.8	359	86	49%	43%	13%
53	Milton	SU 6770 0057	33	64	1.9	28	0.8	260	82	31%	34%	13%
58	Langstone	SU 7078 0500	24	33	1.4	23	1.0	65	31	14%	74%	37%
61	Hayling Billy Trail	SU 7122 0056	34	70	2.1	26	0.8	151	69	23%	38%	23%
64	Mengham	SZ 7398 9910	20	27	1.4	14	0.7	49	29	17%	48%	41%
69	The Promenade, Emsworth	SU 7489 0536	80	137	1.7	24	0.3	1088	157	10%	15%	7%
72	Southbourne / Prinsted	SU 7661 0507	31	62	2.0	32	1.0	182	92	6%	35%	17%
75	West Itchenor	SU 7968 0148	34	78	2.3	27	0.8	206	60	8%	45%	17%
82	Fishbourne	SU 8405 0412	28	49	1.8	27	1.0	80	45	10%	60%	35%
89	Newtown	SZ 4199 9095	21	35	1.7	6	0.3	129	23	19%	26%	16%
100	Ryde	SZ 6047 9251	51	80	1.6	43	0.8	817	279	24%	15%	6%
	Total		784	1322	1.7	550	0.8	33	7	9%	57%	30%

Group Size

2.5 Visitors to the surveyed areas of the shoreline did not generally make the visit alone. The mean number of visitors across at sites was 1.7 with a maximum group size was 10. The Promenade at Emsworth and Hookwith Warsash Nature reserve had the highest number of single visitors. The high number of single visitors to the Hookwith Nature Reserve is probably reflective of those people drawn to the site for wildlife rather than social purposes. The high number of single visitors to the Promenade at Emsworth is probably a function of the higher number of visitors (hence higher numbers of all group sizes) to the site rather than an underlying reason for the visitor behaviour.

2.6 The most frequently encountered group size was 1 person accounting for 53% of the interview response total. 37% of the interviewees were in groups of 2 and the remaining 10% of interview involved groups with 3 or more people.

Dogs

2.7 The monitoring revealed the importance of the Solent coastline as a place for visitors to take and exercise themselves and their dogs. At every site with the exception of Salterns Quay most visitors were accompanied by a dog or dogs. From the 784 groups interviewed 53% had dogs. The number of dogs distributed across all the groups interviewed equates to 0.8 dogs per group.

Temporal variation in visitor patterns

2.8 Most people visited the interview sites frequently with 70% of people visiting at least once a week and of these 42% visited the sites most days (over 180 days per annum). The remaining 30% of visitors (which include those who were visiting for the first time) visited the site with varying degrees of frequency ranging between less than once a month and two to three times per month.

2.9 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. Each visitor responded with an average of 1.6 categories providing 1283 responses. Overall, the visitor monitoring showed there was no obvious preferred time to visit sites throughout the day with 16% of visitors using the site before 9am, 19% between 9am – 12pm, 18% between 12pm -3pm, 20% between 3pm-5pm and 8% after 5pm. The low visitor rate after 5pm is unlikely to reflect the visitor patterns of local residents over the spring and summer when the evenings are lighter.

2.10 Survey effort across the Solent was split equally between weekdays and weekends. Therefore if visitor usage was consistent the same number of people would expect to be recorded on weekdays as on weekends. Of the 784 groups interviewed across the region 473 were interviewed over the weekend and 311 during the weekdays. Of the total number of visitors interviewed 60% were interviewed over the weekends and 40% during the weekdays. Counts of the total number of visitors observed entering a survey location also reflect the same pattern with 2004 (58%) people recorded over the weekend monitoring and 1443 (42%) over the weekday. The total number of visitors to

the surveyed section at weekends was 859 and 463 over the weekdays. Overall the weekday to weekend ratio for the total number of visitors entering is very similar to the weekday to weekend ratio noted in other visitor surveys (Clarke et al. 2006; Liley, Jackson, & Underhill-Day 2006).

2.11 The number of people interviewed over the whole of the region was significantly different at weekends in comparison to weekdays (paired t-test:$t = 4.92$ at $P<0.001$) with more people interviewed (n=784) across the Solent region at weekends in comparison to weekdays.

2.12 The number of visitors interviewed in the week at Ryde and Emsworth was greater than the number interviewed at the weekends which suggests that at these sites visitor pressure is greater in the week than at weekends. However, analysis of the counts of visitors entering each site revealed that 58% of the total number of visitors to Ryde and 62% of the total number of visitors to Emworth were recorded over the weekend period. At these busier sites only a small percentage of the large number visitors were interviewed (Table 1). Fishbourne and Hamble Spit also had equal number of visitor interviews over weekends and weekdays. At Hamble the counts of total number of visitors showed that 64% were entering the site at weekends and 36% over the weekdays. At Fishbourne the data did not show this trend perhaps reflected by the periods of heavy rain during one of the weekend survey sessions (21/2/2010 between 07:30 & 09:30). Excluding these four sites, more visitors were interviewed at weekends than over the week days.

2.13 Visitors were asked whether they tended to visit the area at a certain time of day. Most visitors, 23% did not tend to visit an area at a particular time of day either because they were first time visitors, or they didn't know when they were most frequently on site and visited when they felt like it. The most popular time to make a visit was 09:00 – 12:00 accounting for 21% of the people, followed by 12:00 – 14:00 and 15:00 – 17:00 both with 19% of visitors. Only 12% of people tended to visit before 9am and only 7 % of visitors after 5pm (figure 1).

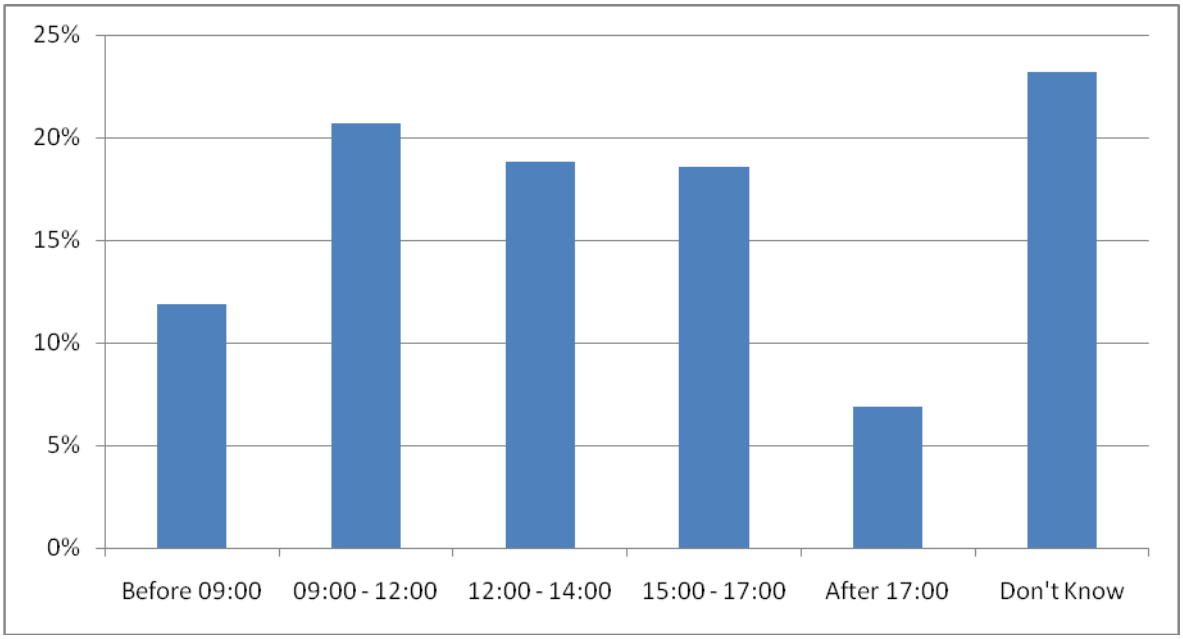


Figure 1: The responses from interviewed visitors when asked 'do you tend to visit this area at a certain time of day?' multiple answers were allowed. The group size combined with the interview responses were used to calculate the percentage of people visiting the Solent at different times of day. The total number sample size was 1981 which is greater than the 1322 visitors recorded a reflection of multiple responses.

2.14 The percentage of people who visited over different time periods during weekends and weekdays shows that the majority of weekend and weekday visitors do not tend to visit an area at a certain time of day. The same visitor patterns are present in figure 2 as are in figure 1. Figure 2 clearly shows the increase in visitors over the weekend period.

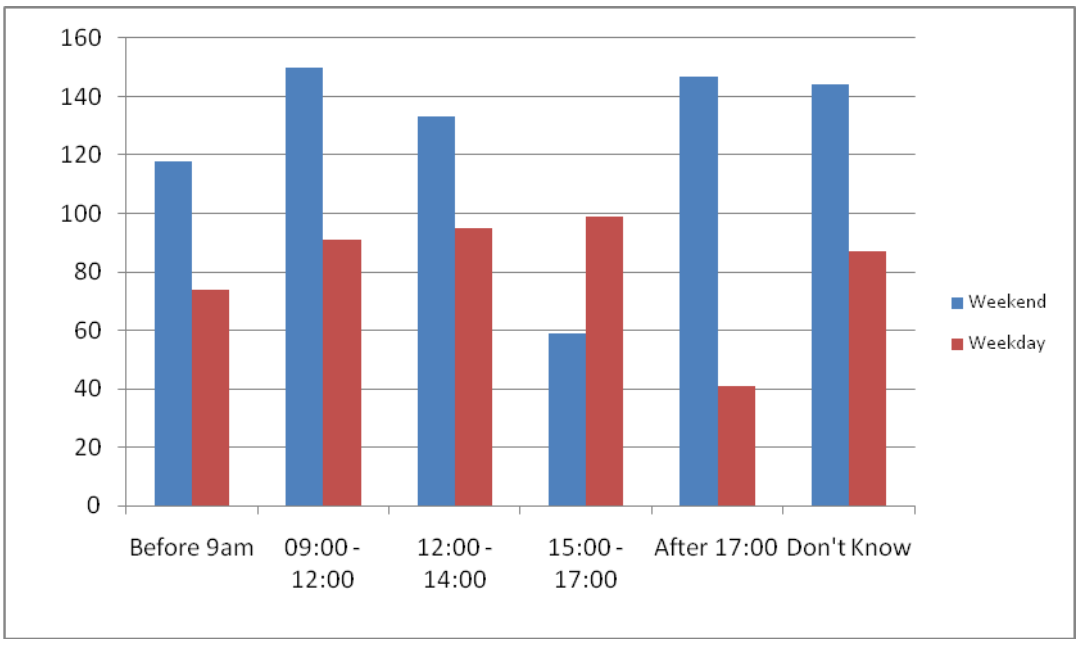


Figure 2: The distribution of visitors to all survey sites at different time periods over weekdays and weekend as captured from the visitor interviews.

2.15 There was a significant difference in the timing of visits to the sites from the visitors interviewed at weekends and weekdays ($\chi^2_5 = 25.00$, $P<0.001$ and $n=1283$). It appears that a smaller number of weekday visitors make their visit after 5pm in comparison to the weekend visitors (figure 2).

2.16 Visitors were also asked whether seasonality influenced how frequently they visit the sites. Again the interviewees were able to select multiple answers and a total of 857 responses were noted from the 784 interviews. The visitors interviewed along the Solent shoreline do not appear to be heavily influenced by seasonality with 66% of the responses stating they visit the site consistently through the year, which is not surprising as the visitor monitoring was conducted in the winter when conditions are less favourable and day light hours are limited. Only 16% of those interviewed expressed they preferred to visit the locations in the Summer. The Promenade at Emsworth and The Hayling Billy Trail each received only a single interview response in favour of Summer visitation.

Activities

2.17 Visitors were also asked about the main activity or activities undertaken during the visit (note that users can undertake more than one activity, for example jogging and exercising the dog which would be noted as two activities). From 784 interviews, 963 activity responses were categorised. Walking was the most popular activity (44% of people interviewed), followed by dog walking (42% of interviews) and together these activities accounted for 86% of the interview responses.

2.18 Of the 42% of people dog walking, one in five (25%) visited the sites on most days compared to 14% of walkers. Of the interviewed groups that were resident in the Solent region, 56% had dogs with them and 46% did not.

2.19 Bird and wildlife watching was cited by 4% of the visitors as a main activity and a family outing by 3% of the visitors. An average of 5.3 different activities were undertaken at each location (Table 2). Bait digging was given as visitor activity at 4 locations (Hooks with Warsash Nature Reserve; Langstone; Milton and Salterns Park) and only 1 visitor was recorded kite surfing (at Calshot) from the region during the survey. Dog walking, walking, cycling and wildlife watching were the most frequently recorded activities undertaken by visitors at the sites. Cycling and wildlife watching were undertaken at 15 of the 20 sample locations. Dog walking and walking was a visitor activity present at every site.

2.20 Many of the activities undertaken were not easily categorised, highlighting the diverse range of visits made to the coast. Activities coded as “Other” (70 interviews) included commuting to work; metal detecting; beach combing; litter picking, wildfowl shooting; photography; geocaching and the collection of drift wood and glass. The activity data gathered from the visitors strongly represented those walking, dog walking, jogging, wildlife watching and cycling. Only a small number of visitors undertaking other activities were interviewed from which only anecdotal observations can be made.

2.21 Only a small number of visitors were undertaking water sports/activity as their main visit activity. Four visitors were enjoying the water by boat and only a single group of 3 kite surfers observed. However, a further 22 people commented that they did visit the Solent for boating but it was not their main activity during their interviewed visit

2.22 Visitors were asked how long they had spent / will they spend in the area during their visit and 47% responded between 1 and 2 hours and 42% advised their visit was less than an hour. Of the remaining responses 6% spent between 2 and 3 hours and 5% spent more than 3 hours on site. No people visited Calshot or Eling for more than 2 hours while 38% of visitors to West Itchenor stayed over 2 hours and 30% of visitors to Lymington (Boldre/Pylewell) also stayed over 2 hours. Eling (81%) and Hilsea (70%) had a large percentage of visitors staying less than an hour.

Motivation for site visit and mitigations

2.23 Visitors were asked what made/motivated them come to the specific site where they were interviewed (question Q9, Appendix 1). Interviewees were able to provide more than a single answer to question. 28% of the visitor responses answered because 'the site is close to home' and 20% of the responses stated the 'attractive scenery and or views' were what specifically attracted them to that location (Table 3). The other popular visitor responses were 'because the site was suited to their activity' and 'because the dog enjoyed it'.

2.24 Visitors were also asked whether they would spend more time, less time or neither/don't know if changes were made to the location they were visiting (question Q12 – Appendix 1). Several of the interviewees didn't know whether the introduction of change would impact the amount of time they would spend on the site. The most opinionated response came from the introduction of change requiring dogs to be on leads, the responses indicate that 41.3% of the interviewees would spend less time on the site and 14.5% would spend more time, while the remaining 44.2% of those who responded did not know whether they would spend more or less time if this change was made (Table 4).

2.25 Other notable responses indicate that 46.7% of interviewees would spend less time if the site they visited was busier and 38.2% of interviewees would also spend less time at the interview location if car parking charges were introduced (Table 4).

Table 2: Range of activities undertaken at each site from interview responses of visitors to the Solent shoreline during Winter 2009/2010. Visitors were able to select more than one activity.

Section	Site Name	Dog Walking	Walking	Jogging/Power Walking /Nordic Walking	Outing with Children /Family	Cycling	Bird watching/Wildlife Watching	Kite surfing	Boating	Bait Digging / Cockling	Fishing	Short cut	Total
4	Lymington (Boldre/Pylewell)	3	4	0	0	1	1	0	0	0	0	0	9
12	Calshot	8	9	0	5	0	1	1	0	0	0	0	24
18	Eling	24	7	0	1	0	1	0	0	0	0	0	33
24	Weston Shore	18	31	1	3	1	4	0	0	0	2	0	60
26	Hamble Spit	29	22	1	1	0	1	0	0	0	0	0	54
32	Hookwith Warsash Nature Reserve	37	36	0	0	1	6	0	0	1	0	0	81
34	Salterns Park	26	52	1	0	1	1	0	0	1	0	1	83
37	Alverbank East	17	46	0	1	2	0	0	0	0	0	0	66
44	Salterns Quay	36	5	0	0	0	0	0	1	0	0	0	42
48	Hilsea	25	17	3	1	3	1	0	0	0	1	0	51
53	Milton	20	10	0	1	2	2	0	0	1	0	0	36
58	Langstone	14	8	0	1	1	5	0	0	4	0	0	33
61	Hayling Billy Trail	21	20	3	3	5	5	0	0	0	0	0	57
64	Mengham	13	8	0	1	0	0	0	0	0	0	0	22
69	The Promenade, Emsworth	24	61	1	1	0	2	0	1	0	0	0	90
72	Southbourne/Prinsted	27	26	2	1	0	0	0	0	0	0	0	56
75	West Itchenor	13	22	0	3	1	2	0	2	0	0	0	43
82	Fishbourne	16	13	1	1	0	2	0	1	0	0	0	34
89	Newtown	6	11	0	0	0	9	0	0	0	0	0	26
100	Ryde	31	18	0	6	0	0	0	0	0	0	0	55
	Total	408	426	13	30	18	43	1	5	7	3	1	955

Table 3: Visitors motivation to visit the interview site. The results are expressed as a percentage of the total number of responses.

Response options when asked what makes you come here specifically rather than another local site	Total responses	As a percentage of the total number of responses
Close to home	433	28.2
Attractive scenery / views	311	20.2
Right place for activity	163	10.6
Good for dog / dog enjoys it	155	10.1
Short travel time from home	94	6.1
Good / easy parking	85	5.5
Ability to let dog off the lead	64	4.2
Choice of routes / ability to do different circuits	58	3.8
Particular wildlife interest	58	3.8
Substrate type (sandy beach)	38	2.5
Refreshments (cafe/pub)	23	1.5
Feel safe here / safety	22	1.4
Suitability given weather conditions	19	1.2
Don't know / others chose	9	0.6
Particular launching facilities	5	0.3
Toilets	1	0.1

Table 4: Responses given by interviewees when asked whether they would spend more time, less time or neither / didn't know if the following changes were made to the site. The results are expressed as a percentage of the total number of responses.

	Site busier	Better path surfaces	Car parking charges	Dogs required to be on leads	Presence of warden / beach manager	Part of the shore closed for wildlife
More time	1.0	21.1	0.5	14.5	16.2	9.3
Less time	46.7	5.0	38.2	41.3	3.7	12.6
Neither / Don't know	52.3	73.9	61.3	44.2	80.1	78.1

2.26 Visitors were asked what features would be necessary to make another site attractive for use instead of the site where they were interviewed (question 13, Appendix 1) . The interviewees were not prompted and more than one option could be selected. The most popular response with 33.5% of the total responses was 'nothing', suggesting they would not be deflected from visiting their current sites (Table 5). The presence of attractive scenery was the most common feature visitors said might attract them to alternative sites; this formed 16.5% of all responses, equating to 24.8% of responses amongst those who did not say nothing would attract them to alternative sites (Table 5). Amongst those who said features might attract them to visit other sites, the other

most popular features cited were a dog friendly site (17% of positive responses) and being closer to home (17.0%) (Table 5). Again the close to home option also supports the responses provided by interviewees in response to why they visited the interview site (question Q9, Appendix 1 and Table 3).

Table 5: Responses given by interviewees when asked what features would be necessary to make another site attractive for use as an alternative to the site where they were interviewed.

What features would be necessary to make another site attractive for you to use instead of here?	Number of responses	Percentage of total responses	Percentage of total responses excluding 'Nothing'
Nothing	342	33.5	---
Attractive Scenery	168	16.5	24.8
Dog Friendly	115	11.3	17.0
Closer to home	109	10.7	16.1
Cheaper / Free Parking	70	6.9	10.4
Better path surfacing	52	5.1	7.7
Refreshments	47	4.6	6.9
Better / Easier parking	35	3.4	5.1
Measures to control other users	29	2.8	4.2
Toilets	25	2.4	3.6
Better launching / access to water	15	1.5	2.3
Better Information	14	1.4	2.1

2.27 Visitors also provided a range of other suggestions of features which might help provide an alternative attractive site. These ranged from better accessibility with flat paths, easy car parking, benches and rest places in walkable distance from home, ability to allow the dog of the lead, availability of fresh water for the dog, areas with dog bins, large open areas, areas with wildlife, safe area, quiet and natural areas with sea views.

2.28 It is clear that visitors have different preferences of what motivates them to visit sites. We can speculate that their preferences are based on where they live (travel distance to coastal site), the activity they undertake on the site and their mobility. The data from this on-site visitor survey on the features and reasons why people do, and do not, visit particular Solent coastal sites will be combined with similar information to be obtained from the household survey in Phase III of this study to try to develop measures of site attractiveness based on the presence of features which either attract or detract people from visiting particular sites.

Mode of transport to the visitor locations

2.29 Of the visitors who were not on holiday 50.5% arrived by car, and 46% visited the areas by foot. Three interviewees arrived by train, ten arrived by bicycle and seven by bus.

2.30 The interviewee responses showed the most popular mode of transport was not consistent between sites. Calshot and Langstone had the highest number of visitors (88%) arriving by car while at Mengham 78% of visitors arrived by foot and only 19% by car. At Hilsea 24% of visitors arrived by car, 10% by bicycle and the rest by foot. Figure 5 shows the method of transport used to access each site by the 1322 visitors. Table 6 details the percentage of visitors to each site by different transportation types. Across

the Solent location 48% of visitors walking dogs arrived at the site by car and 51% by foot.

Table 6: The mode of transport used by visitors to the Solent. Percentages are expressed from the total number of people visiting a site (group size) from the interview data.

Section	Site Name	Car	Foot	Bus	Train	Bicycle	By Water
4	Lymington (Boldre/Pylewell)	70%	30%	0%	0%	0%	0%
12	Calshot	88%	13%	0%	0%	0%	0%
18	Eling	39%	57%	5%	0%	0%	0%
24	Weston Shore	62%	38%	0%	0%	0%	0%
26	Hamble Spit	57%	41%	0%	2%	0%	0%
32	Hookwith Warsash Nature Reserve	71%	24%	3%	1%	1%	0%
34	Salterns Park	62%	36%	1%	0%	1%	0%
37	Alverbank East	55%	41%	3%	0%	1%	0%
44	Salterns Quay	19%	81%	0%	0%	0%	0%
48	Hilsea	24%	66%	0%	0%	10%	0%
53	Milton	42%	53%	0%	0%	5%	0%
58	Langstone	88%	9%	0%	0%	3%	0%
61	Hayling Billy Trail	49%	49%	0%	0%	3%	0%
64	Mengham	19%	78%	4%	0%	0%	0%
69	The Promenade, Emsworth	53%	46%	1%	0%	0%	0%
72	Southbourne/Prinsted	77%	23%	0%	0%	0%	0%
75	West Itchenor	74%	23%	0%	0%	0%	3%
82	Fishbourne	67%	29%	0%	4%	0%	0%
89	Newtown	80%	14%	0%	0%	6%	0%
100	Ryde	71%	28%	1%	0%	0%	0%
	Overall	58%	39%	1%	0%	1%	0%

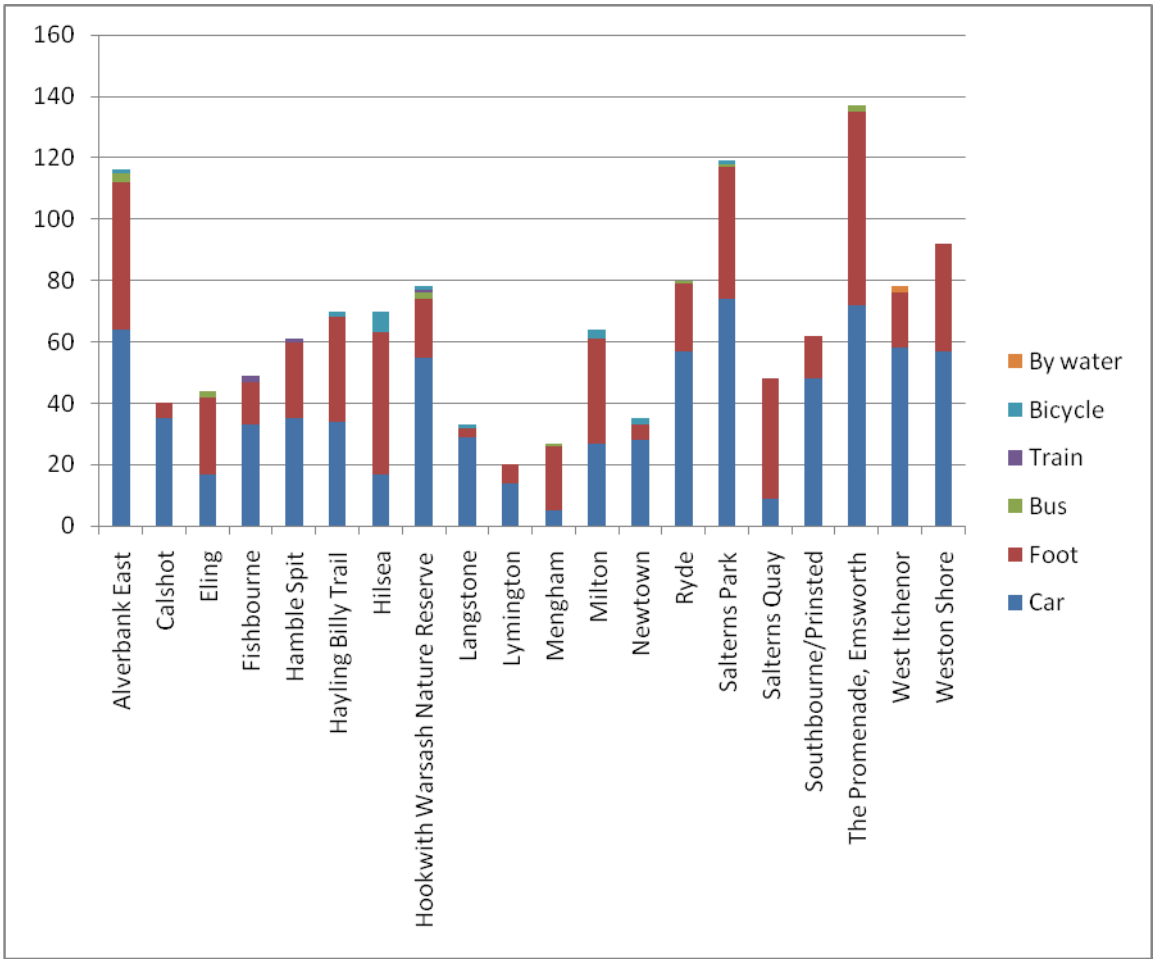


Figure 3: Mode of transport used to access each site from the 1322 visitors to the Solent regions during Winter 2009/2010 including those on holiday.

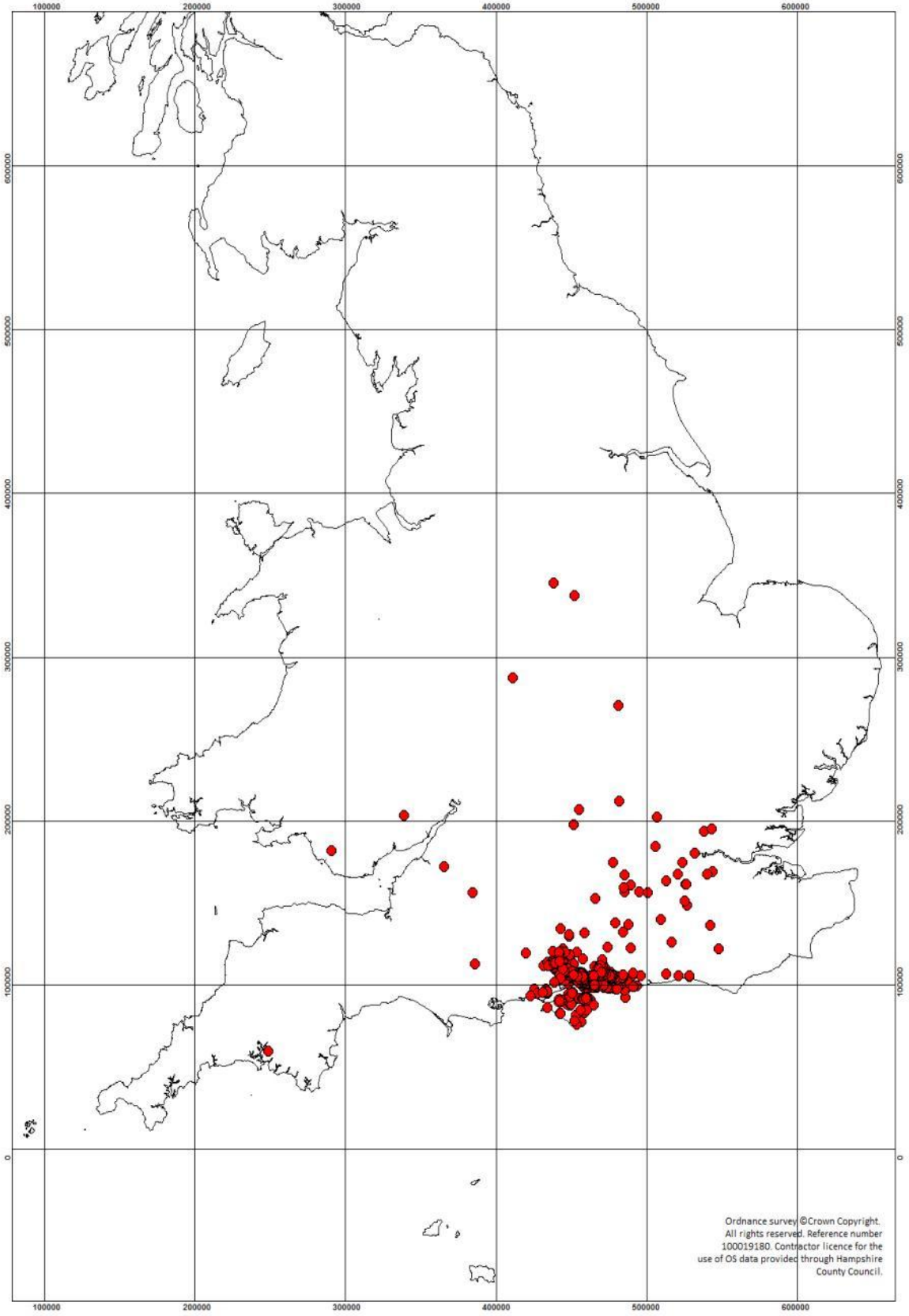
Distances travelled to Solent access points

2.31 From the 784 visitors interviewed only 39 (5%) either were not willing or provided incomplete/invalid postcode information. Of these 39, 4 were overseas visitors. A further 4% of visitors only provided the name of their town or village and in these instances the home location data points were plotted manually onto the GIS at the central location of the town or village. Overall the visitor monitoring captured the home postcode location of 745 interviewees (95.0%).

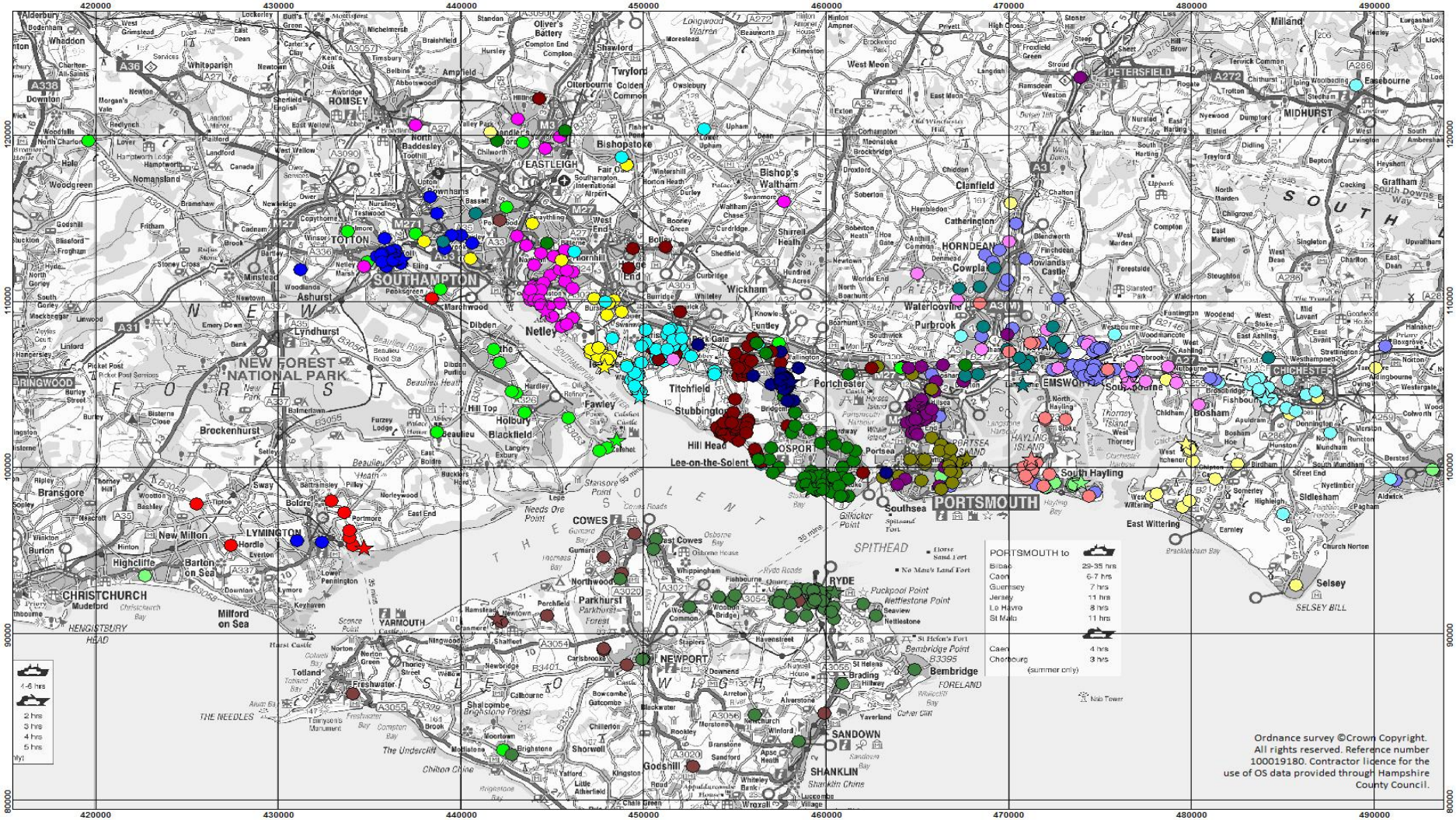
2.32 Map 3 shows the home postcode locations of all interviewed groups. Visitors have travelled from Devon, Wales, Surrey London and Derbyshire, but the majority of visitors come from Dorset, Hampshire and Sussex. The home postcode locations of visitors to the survey locations is illustrated in Map 4 and clearly shows how localised the use of each site is.

2.33 On average visitors who were not on holiday lived 5.04km from the area they visited. When holiday makers were included in the analysis the average distance between the visitors home postcode and the interview site increased to 13.6km. Only visitors that were on holiday arrived by boat and no visitors arrived by horse (figures 4 and 5).

Map 3: The postcodes of interview visitors to the Solent during the Winter 2009 / 2010.



Map 4: The home postcodes of interviewed visitors to survey locations in the Solent during Winter 2009 /2010. The visitor postcodes are colour coded (consistent with map 2) to the locations at which they were interviewed. Survey locations are shown with stars and postcodes by dots. Refer to map 2 for coastal section numbers.



2.34 Visitors also appeared to travel various distances to undertake different activities (Table 7 and figure 5). Three of the five visitors that listed boating as the activity lived 48km or further from the site at which they were using. In contrast, visitors who listed dog walking as an activity were much more localised to the interview location with half living within 1.20km whereas half of all walkers lived within 2.70km. From Table 7 and figure 5, we can infer that visitors boating, fishing, kite surfing, wildlife and bird watching, taking an outing with children/family generally travel further to undertake these activities at a site. It seems that visitors are willing to travel further if the site is able to offer an activity for them, such as the above In contrast, joggers, power/Nordic and the frequent dog walkers live closest to the sites; most notably, half of all interviewed dog walking visitors lived within 1.2km of the survey location.

2.35 As well as considering the distance and transport methods between the home postcode and shoreline sections the visitor patterns should also be considered on a site by site basis as the distribution of visitors across the sampled sites was not even (section 2.2). Figure 7 shows the distance between visitors home post codes and the site visited is not uniform in its distribution; however it does not consider the mode of transport used to access each site.

Table 7: Distance from the visitors home postcode to site by the activity undertaken by the visitor at the interview site from all interview responses.

Activity	Median linear distance from home postcode to visited site (km)	Number of visitor responses given as an activity
Boating	48.3	5
Fishing	9.90	8
Kite surfing	9.83	1
Outing with children/family	6.15	30
Birdwatching / wildlife watching	5.05	40
Walking	2.70	404
Bait Digging	2.54	8
Cycling	2.36	16
Jogging/Power Walking/Nordic Walking	1.71	11
Dog Walking	1.20	389

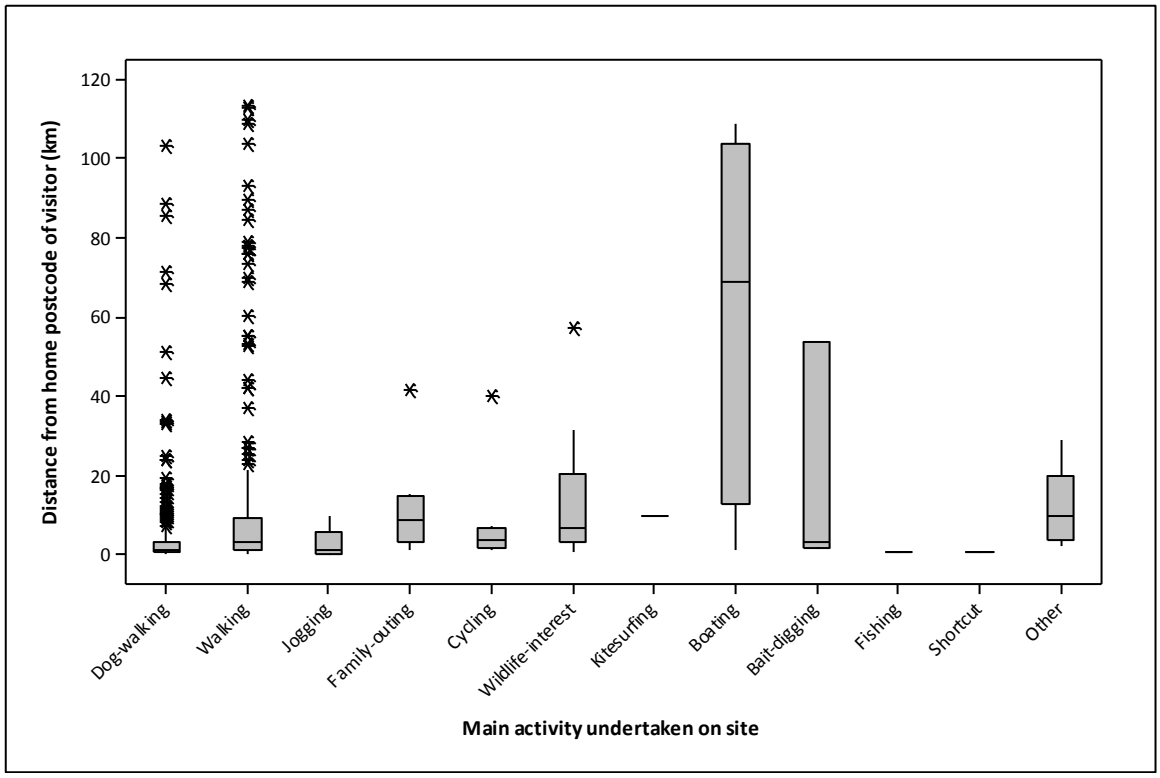


Figure 4. The distances between interview location and the visitors home postcode, grouped by the activity undertaken during a visit.

Transport mode and distance to site

2.36 The methods of transport used to travel to the interview location and the distance of the visitors home postcode was investigated and figure 6 shows the distance between the visitors home postcode and the interview location by the mode of transport. Visitors arriving by boat and train were omitted because of small sample size. Figure 5 shows the median distance between the interview location and home postcodes of visitors least for those visitors who arrived by foot. The distance from the interview location to home postcode of visitors arriving by car or motorcycle was the most far ranging.

2.37 Half of all visitors arriving on foot (referred to as "foot visitors") living within 0.7km, while half of all visitors arriving by car ("car visitors") live more than 4km away (Table 8). Only 9% of foot visitors live more than 2km away compared to 80% of all car visitors (Figure 6).

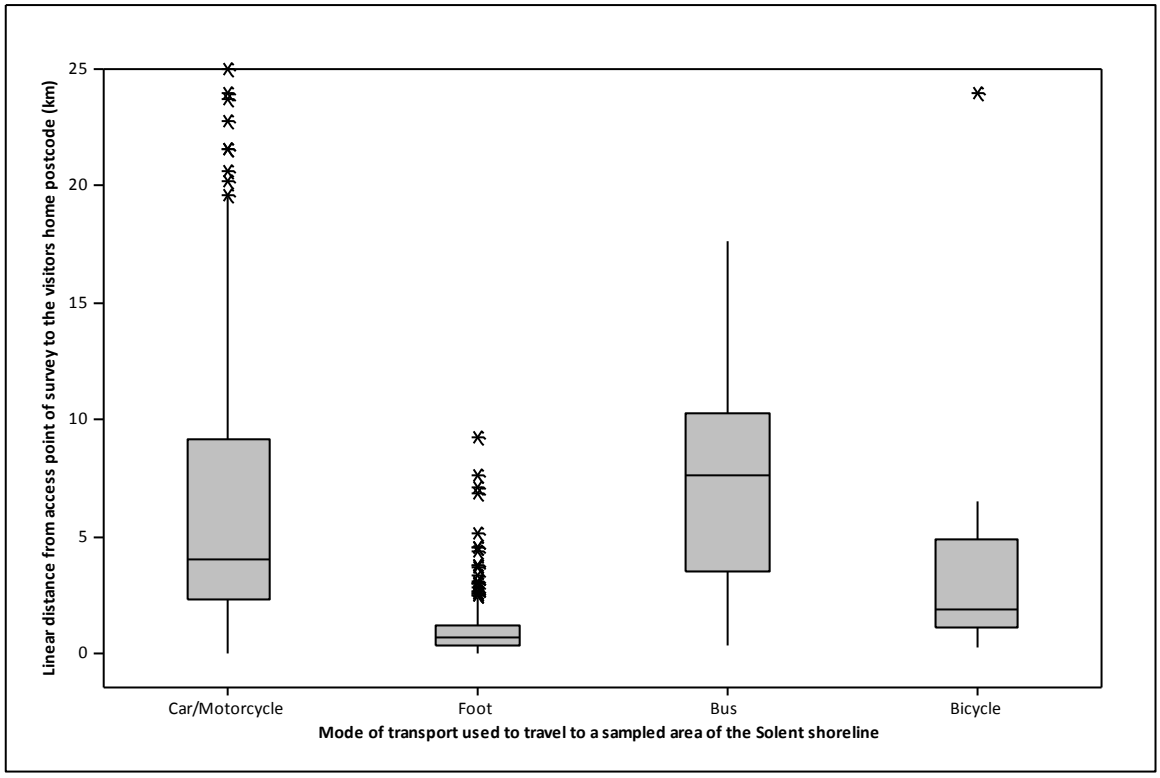


Figure 5. The distances travelled for each mode of transport used to travel from the home postcode of the interviewed visitor to the access point of the interview location. The figure excludes data from interviewed visitors who were on vacation so represents the movements of local residents only. The figure was truncated at 25 km to easily identify the differences between the transportation modes in median (50%) distances (shown by horizontal line in middle of the 25-75% shaded boxes).

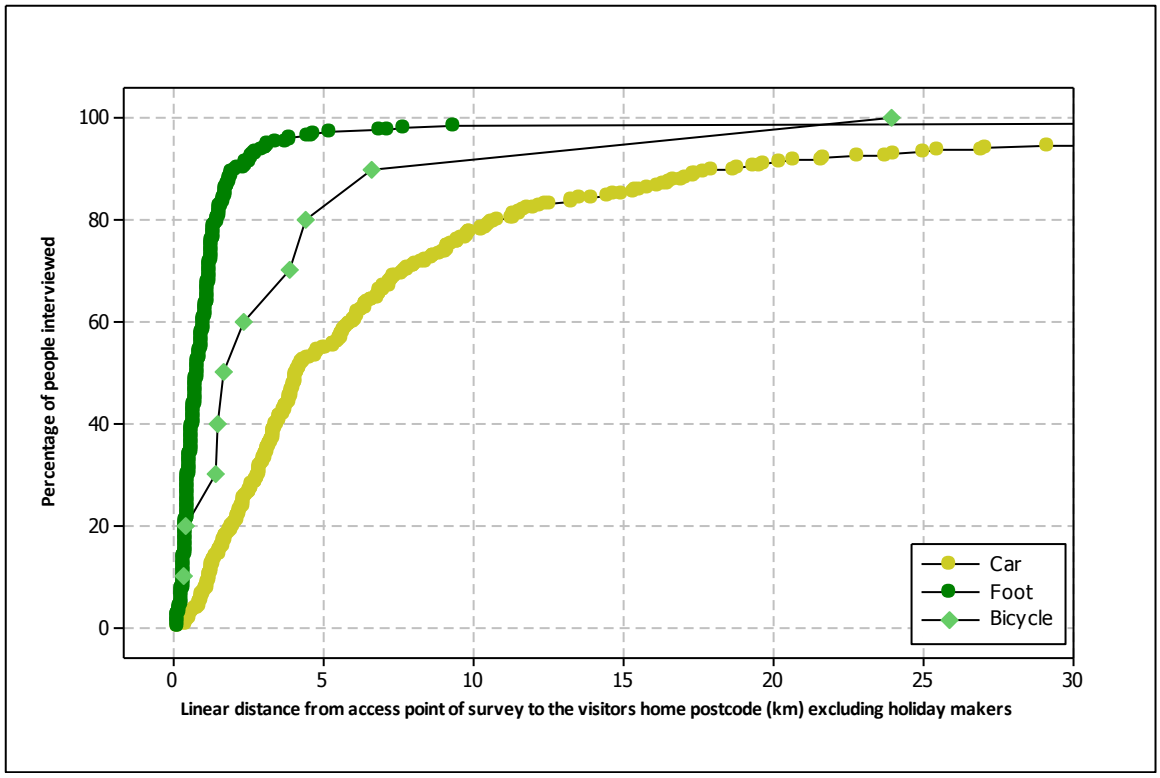


Figure 6. Cumulative frequency distribution of the linear distance from the interviewed visitors home postcode to the access point at the interview location by mode of transport used to get to the site. The figure was truncated at 30km. (Curves show percentage of visitors travelling this distance or less)

Table 8. Distance (km) from the home postcodes of visitors excluding those on holiday to the Solent sites according to the mode of transport used to travel.

Transport used to access survey site	Number of people (non-tourists)	25%	Median (50%)	75%	Maximum
Car	355	2.3	4.0	9.1	128.9
Foot	328	0.4	0.7	1.2	9.3
Bicycle	10	1.1	1.9	4.9	23.9
Bus	7	3.6	7.6	10.3	17.6
Train	4	-	76.1	-	89.6.

2.38 We would expect visitors using a car to travel a greater distance to a site than those arriving by foot. We considered whether the distance visitor's travel using different modes of transports also differed between sites. Table 9 details distances travelled to each site for each interviewed visitor. Only data from visitors who were not on holiday were included in the analysis and four responses were excluded from the by foot arrival method as the distances between the home postcodes of these visitors exceed 80km suggesting some error in comprehension or interpretation of the question. The absent

values in Table 9 for foot visitors Calshot and Mengham and car visitors to Mengham) are reflective of the low number of interviews at these locations.

2.39 The overall median distance among all non-tourist visitors to all sites is only 1.66km. Calshot was the location where visitors travelled furthest from home to visit by car where half of all interviewed visitors travelled 14.3km. In contrast at Salterns Quay half of all car visitors lived within 0.9km of the site. The most localised use of sites by foot visitors was observed at Newton and Southborne where half of visitors to these areas lived within 0.3km. The largest median distances travelled by foot visitors from home were to Hookwith Warsash Nature Reserve , where half of the 16 interviewed foot visitors lived more than 1.5km distance from the survey location (Table 9).

2.40 Overall the distances foot and car visitors travelled to each site was relatively localised with half of all foot and car visitors to Calshot living within 11.9km of the site, the largest median distance to any section surveyed. The stretch of shoreline at Mengham had the shortest overall median travel distance with half of all visitors living within 0.4km of the site (Table 9).

2.41 Mengham, Lymington (Boldre/Pylewell) and West Itchenor attracted visitors from a much wider catchment area (figure 8). Mengham and Lymington (Boldre/Pylewell) had the smallest numbers of visitors recorded from all the sampled locations. The distance between the visitors home postcodes and West Itchenor had the largest inter quartile range of distances (i.e. variability as represented by the largest grey box). This site is used almost equally by nearby residents and visitors who travel much longer distances.

Figure 7: Distance of the visitors' home postcode to each interview location for all sampled sites in the Solent Region. The graph was truncated at 75km.

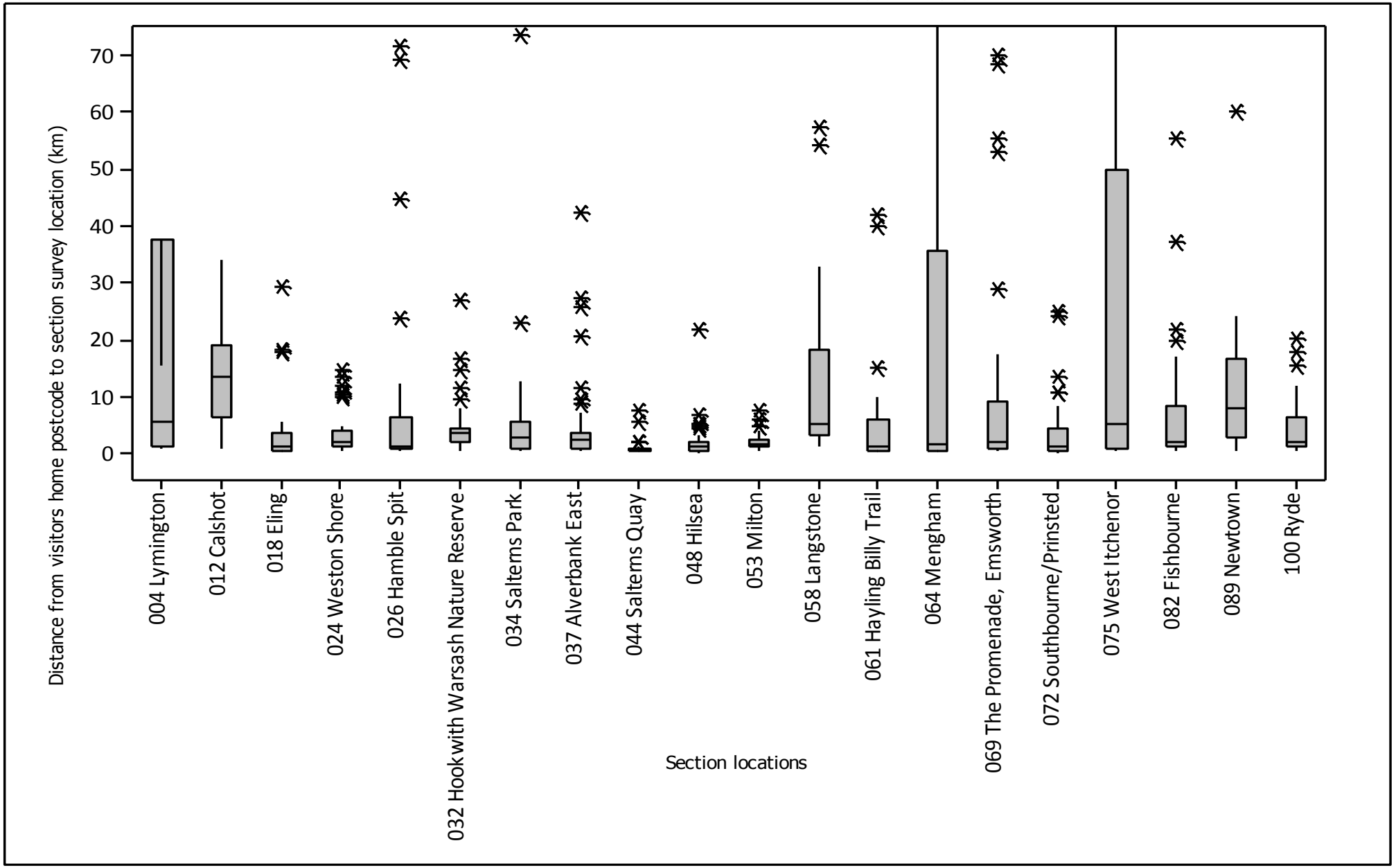


Table 9: Distances (km) travelled to each survey location, separately for the (N) visitors arriving by car and on foot; right hand columns giving overall median distances travelled to each site and their ranks (1 = lowest median)

Section	Survey location	Car						Foot						Combined		
		N	Min.	25%	Median	75%	Max.	N	Min.	25%	Median	75%	Max.	N	Median	Rank of Median
4	Lymington (Boldre/Pylewell)	6	2.4	3.1	8.4	43.8	128.9	3	0.6	0.6	1.0	1.3	1.3	9	3.4	16
12	Calshot	18	3.0	7.6	14.3	18.8	34.1	2	0.7	*	0.9	*	1.1	20	11.9	20
18	Eling	10	1.6	2.9	3.7	8.7	29.2	19	0.3	0.4	0.5	1.0	1.4	29	1.0	5
24	Weston Shore	26	0.3	1.7	2.8	6.0	14.6	18	0.3	0.7	1.3	1.5	3.8	44	1.7	11
26	Hamble Spit	19	0.4	1.2	4.1	12.2	71.4	20	0.3	0.4	0.7	1.0	1.3	39	1.1	7
32	Hookwith Warsash Nat. Res.	34	1.2	2.9	3.7	4.9	26.9	16	0.2	0.5	1.5	2.3	4.4	50	3.2	15
34	Salterns Park	36	0.5	3.7	4.7	6.1	73.5	23	0.1	0.4	0.7	1.3	2.3	59	2.3	14
37	Alverbank East	28	1.1	2.2	3.3	6.9	42.4	28	0.3	0.6	0.9	1.4	9.3	56	2.0	13
44	Salterns Quay	6	0.5	0.5	0.9	2.9	5.5	31	0.2	0.4	0.5	0.7	7.6	37	0.5	2
48	Hilsea	9	0.9	1.1	2.3	4.6	21.6	33	0.1	0.2	0.8	1.2	5.2	42	1.0	6
53	Milton	11	1.1	1.7	2.3	4.7	7.4	20	0.3	0.6	1.1	1.4	4.5	31	1.2	8
58	Langstone	15	1.2	3.1	3.9	7.2	53.9	2	1.6	-	4.4	-	7.1	17	3.8	18
61	Hayling Billy Trail	11	0.5	1.8	6.8	9.8	39.9	18	0.4	0.4	0.5	1.1	3.0	29	0.9	3
64	Mengham	2	1.5	-	1.7	-	2.0	9	0.4	0.4	0.4	0.5	1.9	11	0.4	1
69	The Promenade, Emsworth	27	0.6	2.0	6.5	9.1	17.4	35	0.1	0.6	0.9	1.7	6.9	62	1.7	11
72	Southbourne/Prinsted	17	0.3	1.2	3.4	9.5	25.0	11	0.1	0.1	0.3	0.6	0.8	28	1.0	4
75	West Itchenor	20	0.4	3.5	9.1	43.7	87.3	9	0.3	0.3	0.5	0.8	3.7	29	3.7	17
82	Fishbourne	16	1.3	1.7	3.4	15.0	55.1	10	0.4	0.5	0.7	1.2	1.3	26	1.6	9
89	Newtown	11	6.1	6.9	9.0	16.3	18.8	5	0.3	0.3	0.3	1.5	2.7	16	7.1	19
100	Ryde	33	0.8	1.5	3.1	8.9	20.2	16	0.3	1.0	1.1	1.3	2.6	49	1.7	11
	Overall	355	0.3	2.3	4.0	9.1	128.9	328	0.1	0.4	0.7	1.2	9.3	683	1.7	

Relationship between housing density and visitor numbers

2.42 To investigate possible relationships between the number of houses in the Solent region and the number of visitors who lived within different buffer zones around all the surveyed sites were identified (figure 8). A greater number of visitors to survey locations were found in the nearer distance bands to each location, it is likely that this represents the number of visitors that arrive to each location by foot as their spatial distribution will be concentrated in comparison to visitors who arrive by car. Figure 6 shows that 80% of foot visitors live within 1.5km.

2.43 The same method was undertaken for houses within the same buffer zones around all the survey sites (figure 9). The distribution of visitors was compared the spatial distribution of residential dwellings within the same distance bands. The number of residential dwellings adjacent to the sampled sites is limited but steadily increases with distance away from the survey locations until 10km where the number of dwellings in each distance band appears to plateau until a distance of 18.5km is reached when the number of houses around all the access locations increases. Comparing figures 8 and 9 a higher proportion of residents that live within 1.5km of a survey visit the coastal areas that those who live further afield.

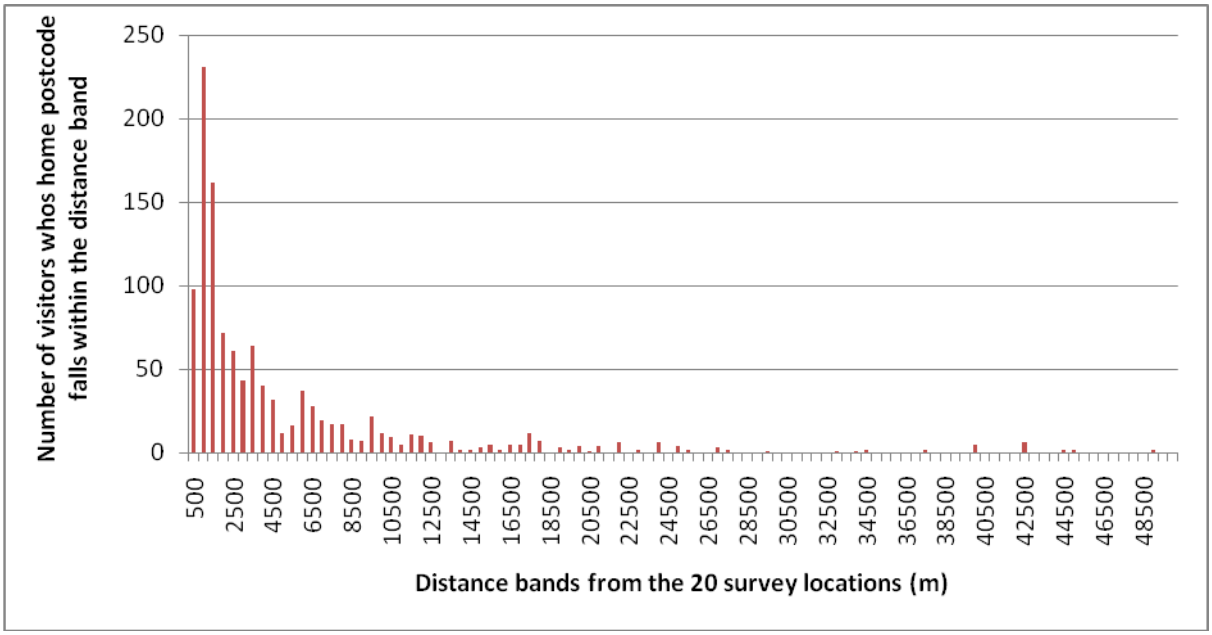


Figure 8: The number of visitors recorded on the 20 sites across the Solent categorised by the distance from their home postcode to the site they visited.

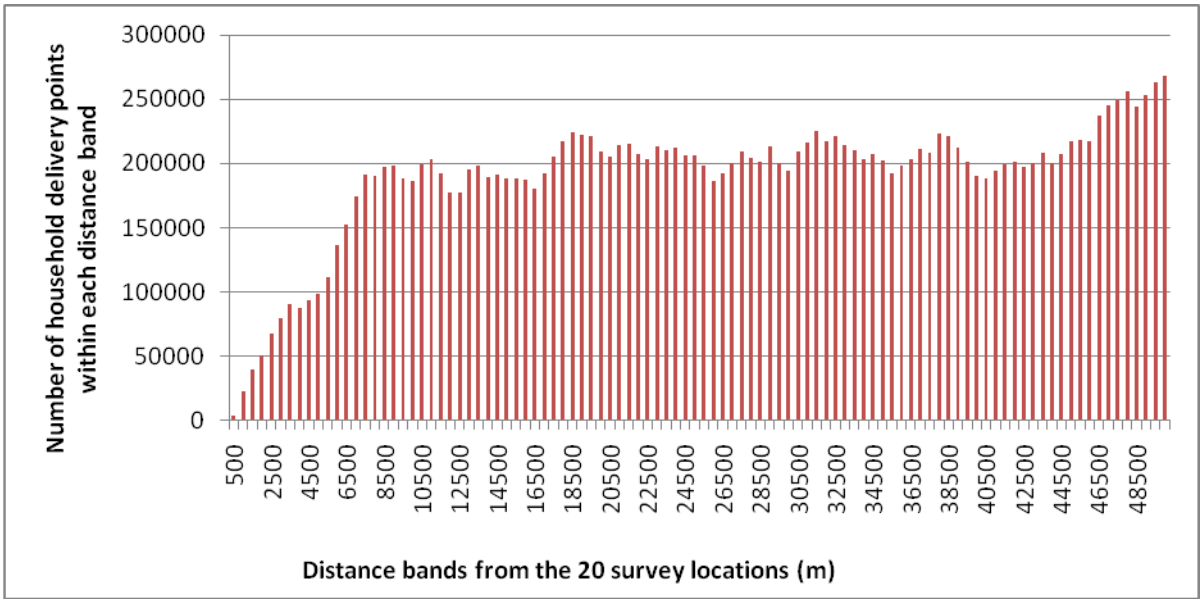


Figure 9: The number of residential dwellings within fixed distance bands of all sampled locations of the Solent.

Visitor numbers and housing density within fixed distances of access points

2.44 The tally totals of visitors to each location were compared to the number of houses within different distance bands of each access point to investigate potential relationships between visitor numbers and housing densities. The tally totals were counts of people entering and leaving each site or recorded using the sites (see section 2.4). These values will inevitably include some counts of visitors who were on holiday.

2.45 The total number of visitors at each site was significantly correlated to the number of houses present within 1km of the survey locations (where Spearman's rank correlation co-efficient = 0.62, P=0.004) when considering the number of visitors to all sites. As the distance from access location increased the strength of the correlation between number of houses and number of visitors decreased not only in strength but also significance. However, beyond 1km additional factors to housing density influence visitor numbers and we may speculate these to be a combination of (and not exclusively restricted to) travel time, car parking spaces, aesthetics of the location and path quality.

2.46 Linear regressions using housing density within different distance bands as a predictor of visitor number were conducted to further explore any possible relationship. The regression analysis excluded the two outlying sites (Emsworth and Ryde) identified by the correlation analysis. There was a significant relationship between the number of houses within 1km, 3km and 5km of a survey location and the number of visitors (Table 10). With the number of houses explaining 53.6%, 43.3% and 40.6% of the variation in visitor numbers. At distances of 10km and over the relationship between housing density and number of visitors is less prominent and not significant. Figure 10 illustrates the link between houses within 1km of a survey location and visitors. It shows that survey locations with higher number of visitors had a higher housing density within the 1km distance band. The two outlier points which received a notably higher number of visitors than the other sampled sites are present on the graph. Figure 11 shows that at

15km there is no significant relationship between the number of houses present around survey locations in the Solent and the total number of visitor recorded.

Table 10. Proportion (R^2) of variation in recorded number of visitors to each survey location explained by linear regression relationship with the number of houses within a fixed distance of the location; p value = no relationship test probability .

Fixed distance	R^2	P value
1km	53.6	0.001
3km	43.3	0.003
5km	40.6	0.004
10km	27.1	0.270
15km	16.7	0.920
30km	9.9	0.204

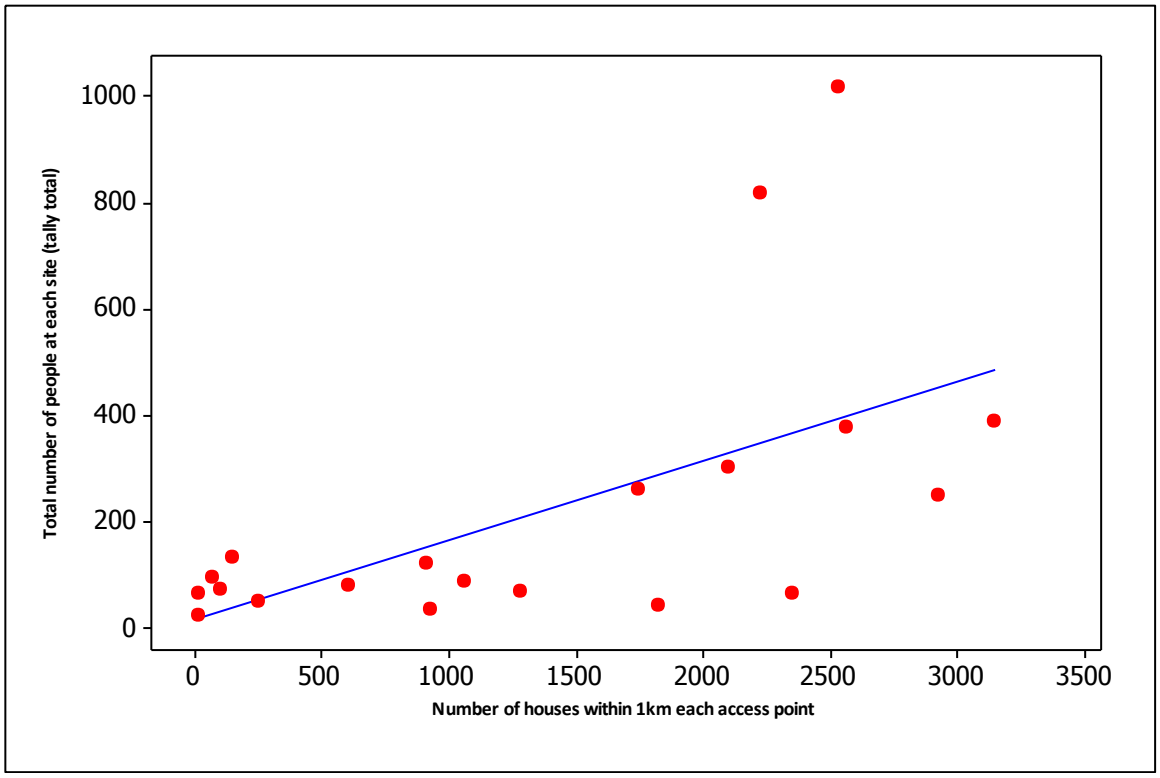


Figure 10. The number of houses within 1km of each access point in comparison to the number of visitors recorded entering each survey area (% variation explained (R^2) = 53.6%).

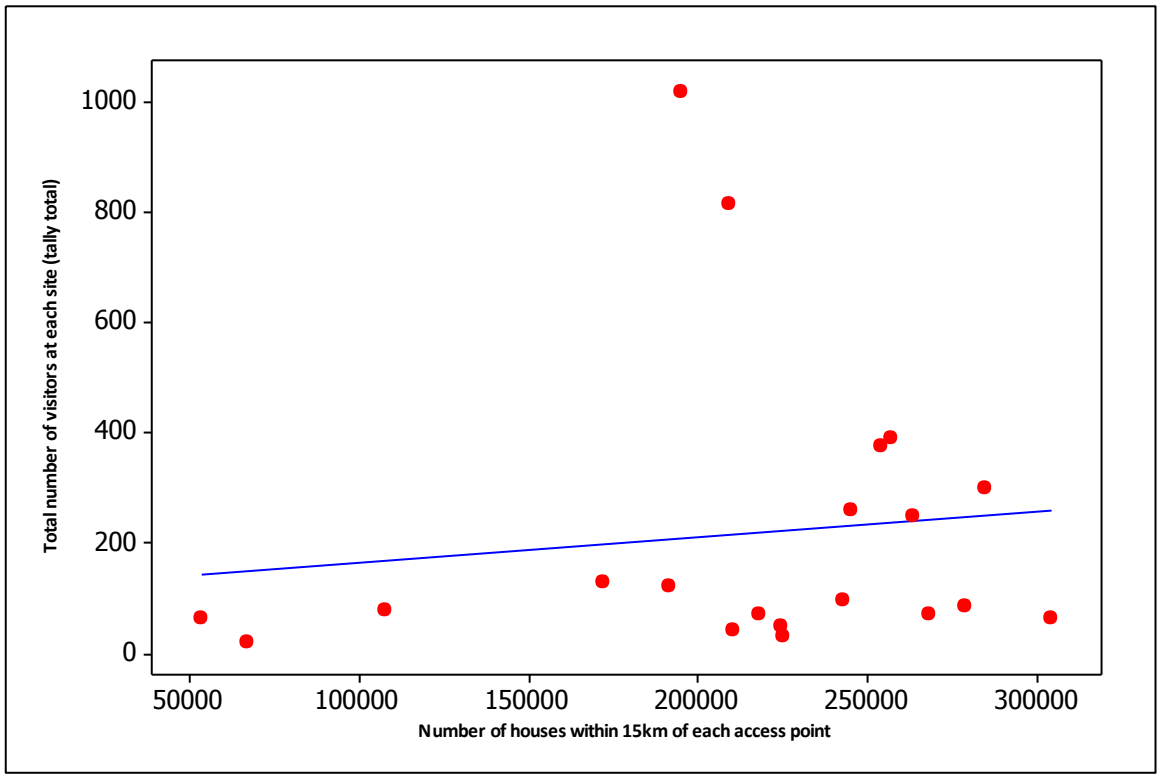


Figure 11. The number of houses within 15km of each access point in comparison to the number of visitors recorded entering each survey area (% variation explained (R^2) = 16.7%).

Visitor numbers in relation to car-parking and housing

2.47 We estimated the total number of visitors arriving by car (N_{iC}) to an access point (i) as the number of geo-referenced car visitors multiplied by the ratio (F_i) of total recorded visitors to the point to total geo-referenced visitors (car+foot+others) to the point during the survey period.

2.48 Previous studies of visitors to heathland have found a reasonable close relationship between the number of visitors arriving at a heath access point by car and the number of car parking spaces available at the access point (Liley *et al.* 2006). The frequency of visitors arriving by car (N_{iC}) to the Solent coast is more complex (Figure 12). There is some tendency for the number of car visitors to be greater at surveyed access points with more official or off-road car parking spaces. However, the number of visitors through an access point arriving from home by car is also influenced by the extent of nearby roads, as (potential) additional parking. The four survey points with the highest car visitors had both intermediate/high levels of car park spaces and high length of nearby roads. In particular, the Promenade at Emsworth (section 69) and the Ryde (section 100) survey points had the most visitors arriving by car, only intermediate levels of parking facilities, but more potential road parking within 500m (Figure 12). This suggests that any modelling of car visitor rates should involve these measures of both official/off-road parking spaces and potential road parking related to the length of nearby roads (i.e. within 500m of the access point).

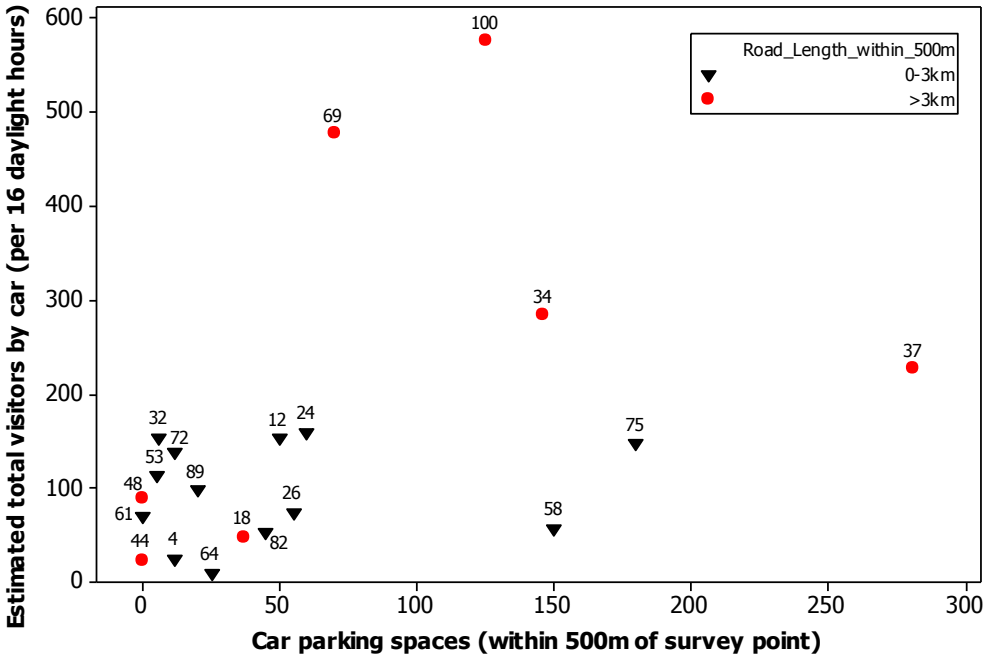


Figure 12 Estimated total number of visitors (interviewed and non-interviewed) arriving by car during the 16 hour surveying period in relation to the number of (off-road) car-parking spaces within 500m of the survey point within the numbered survey sections (symbols denote survey points with <3km (▼) and >3km (●) of total road length within 500m

Table 11: Car-visitors (geo-referenced and estimated total) in 16 daylight hours to the 20 surveyed section access points together with car parking spaces and length of road within 500m

Section	Site name	Geo-referenced people arriving by car	Estimated total visitors arriving by car	Car parking spaces (official and off-road)	Total length of roads (km) within 500m of survey point
4	Lymington	12	24.8	12	1.23
12	Calshot	35	155.7	50	0.99
18	Eling	15	48.8	37	3.63
24	Weston Shore	51	162.6	60	2.95
26	Hamble Spit	31	75.5	55	2.08
32	Hookwith Warsash Nature Reserve	50	156.5	6	1.39
34	Salterns Park	63	288.9	146	3.77
37	Alverbank East	57	230.9	281	4.00
44	Salterns Quay	8	22.4	0	6.47
48	Hilsea	16	91.2	0	4.35
53	Milton	27	115.1	5	2.51
58	Langstone	19	58.8	150	1.52
61	Hayling Billy Trail	29	71.8	0	2.56
64	Mengham	3	10.5	25	2.52
69	The Promenade,	46	485.9	70	5.19
72	Southbourne/	44	140.5	12	2.48
75	West Itchenor	40	149.8	180	1.36
82	Fishbourne	30	54.5	45	1.49
89	Newtown	17	99.7	20	0.62
100	Ryde	56	586.6	125	4.12

Visitor rates in relation to distance

Foot visitor rates

2.49 Figure 13 shows the overall average rate of visiting a survey location on foot in relation to the distance from home postcode to the survey location. All of the residents and all of the visitors were grouped into distance bands from the survey location, using bands of 0.5km, 1km or 2km as appropriate for the frequency of visits. For any particular distance band *k*, the foot visitor rate P_{kF} was calculated as:

Sum across all locations of the number of foot visitors living within distance band *k* divided by Sum across all locations of the number of residents living within distance band *k* of the location.

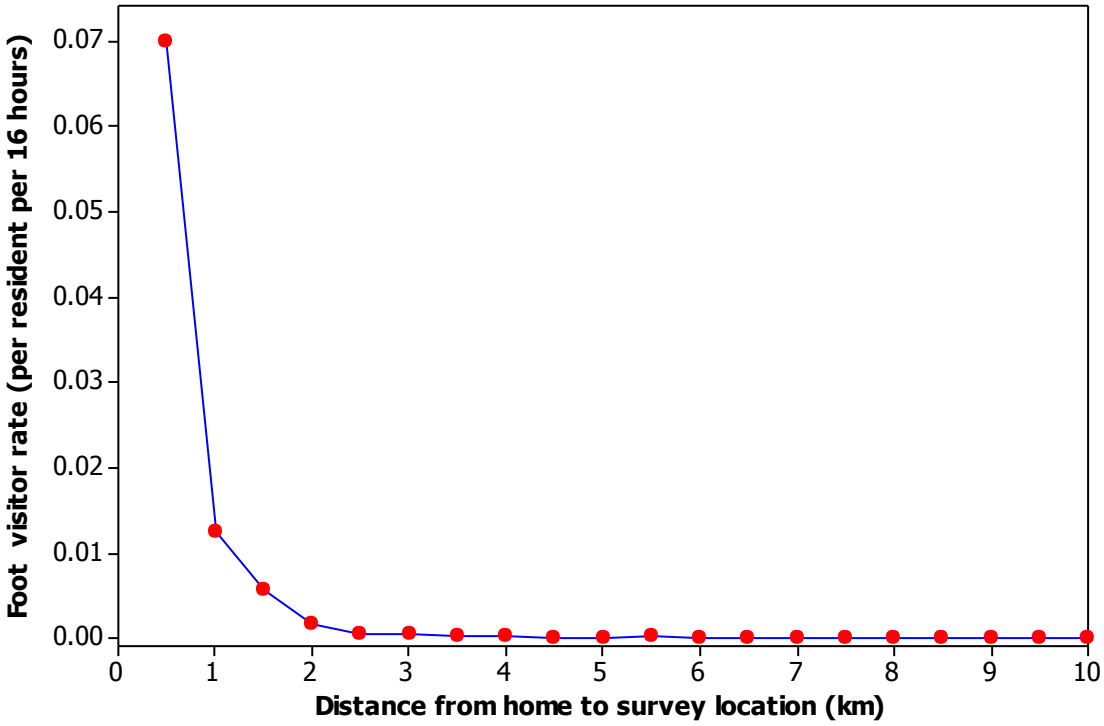


Figure 13: Overall average rate of visiting the 20 survey locations on foot in relation to distance (0.5km bands) from home postcode to a survey location

2.50 This measures the average number of visits made on foot from home per resident per 16 daylight hours and is given in 0.5km distance intervals in Table 12.

2.51 For residents living within the 500m of the survey location, the estimated average rate of visiting a site (per 16 hrs) on foot (0.069970) is more than ten times the estimated rate of visiting by car (0.006144), as might be expected for all except less mobile residents. However, for residents in the 1.5-2.0km band, the foot visitor rate has declined by 98% rate to only 0.001633 (per resident per 16 daylight hours), roughly equal to the car visitor rate (0.001743) for residents in that distance band. When 5km away, the estimated frequency of walking to a Solent coastal location is on average only 4 visits per 100,1000 residents per 16 daylight hours, whereas the equivalent rate for car visits is roughly 19 per 100,000 residents (Table 12).

Table 12: Overall (i.e. combined across survey locations) numbers of residents, foot visitors, car visitors and foot and car visitor rates (per resident per 16 daylight hours) in relation to 0.5km bands of distance from home to survey location.

Distance band max	Total	Total foot	Total car	Foot visitor	Car visitor
0.5	9670	676.6	59.4	0.069970	0.006144
1.0	53660	661.5	110.2	0.012329	0.002053
1.5	93246	510.2	248.8	0.005472	0.002668
2.0	120374	196.5	209.8	0.001633	0.001743
2.5	158828	50.7	183.5	0.000319	0.001155
3.0	187622	84.4	147.6	0.000450	0.000786
3.5	214638	29.9	211.5	0.000139	0.000986
4.0	206307	13.2	116.8	0.000064	0.000566
4.5	219598	3.1	106.1	0.000014	0.000483
5.0	232077	10.0	43.9	0.000043	0.000189
5.5	262300	17.1	80.2	0.000065	0.000306
6.0	321657	0.0	194.9	0.000000	0.000606
6.5	360098	0.0	165.7	0.000000	0.000460
7.0	412090	10.6	67.1	0.000026	0.000163
7.5	451427	3.1	62.7	0.000007	0.000139
8.0	449516	5.6	74.4	0.000013	0.000166
8.5	466702	0.0	52.1	0.000000	0.000112
9.0	467856	0.0	49.2	0.000000	0.000105
9.5	443635	4.1	137.9	0.000009	0.000311
10.0	440388	0.0	52.3	0.000000	0.000119

Car visitor rates

2.52 A similar approach was used to access the rate of residents visiting a Solent coastal survey location by car in relation to the distance from their home to the survey location (in this case using 1km distance bands) (Figure 14).

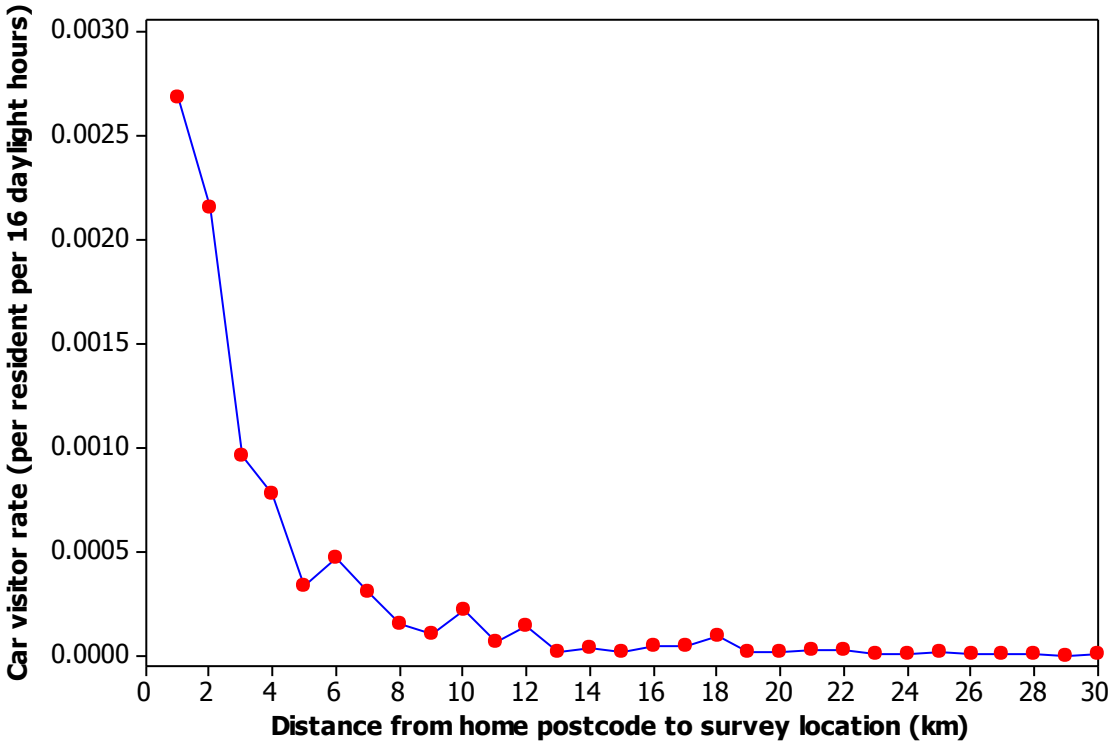


Figure 14: Overall average rate of visiting the 20 survey locations by car in relation to distance (1km bands) from home postcode to a survey location

Car visitor rate in relation to distance from home and car parking spaces

2.53 To assess the effect of the availability of car parking spaces on visitor rates at Solent access points, the 20 survey locations were amalgamated into three groups based on their estimated number of official and off-road car parking spaces within 500m of the survey location (based on Google Earth). The estimates of spaces for individual locations are given in Table 14. The derived location groupings were based on 0-6, 7-80 and 81-300 car parking spaces involving 5, 10 and 5 locations respectively.

2.54 From Figure 15 we see that the rate at which residents living within 4km visit a Solent location by car tends to be on average 4-5 times higher at sites with many (>80) car parking spaces compared to those with none or only a few (<7). At greater distances with fewer visitors in general the pattern is less clear.

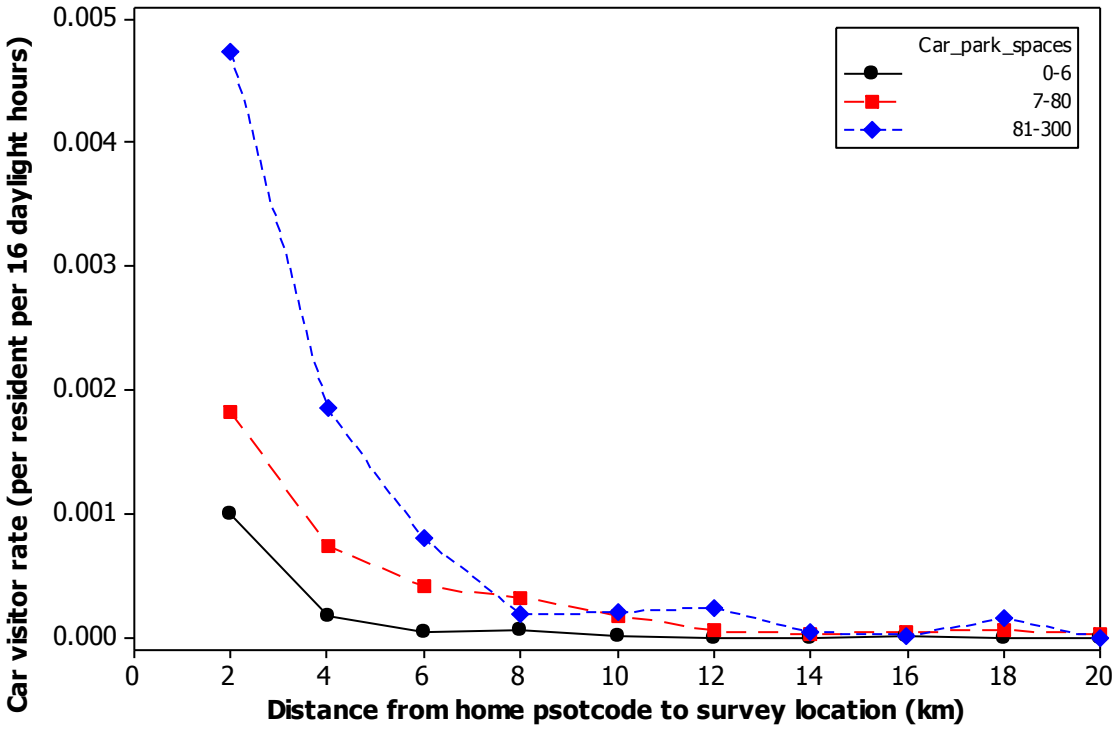


Figure 15: Visitor rates by car (per resident per 16 daylight hours) in relation to distance (2km bands, 0-2km, 2-4km, etc)) from home postcode to the survey site, separately for sites grouped by number of car parking spaces (0-6 (●), 7-80 (■), 81-300 (♦) spaces, involving 5 , 10 and 5 sites respectively (see Table 15).

Visitor Routes

Of the 784 visitors interviewed 774 questionnaires contained route data which was suitable for route analysis. In analysing the route data we did not filter out the data from holidaymakers or those who did not live in the region as we were not interested in the distance travelled to the site but how the site was used and how usage and route varies between activity. The distance of visitor route varied with activity. Joggers had the longest routes with over half of joggers covering 4.52km and bait-diggers covered the shortest route with half of all routes under 0.63km (Table 11).

Table 13. The average route distance covered by all visitors to the Solent region while undertaking different activities

Activity	Median route length (km)	Sample size
Jogging / power walking / nordic	4.52	13
Cycling	4.16	18
Walking	3.10	426
Fishing	2.78	3
Dog walking	2.55	408
Boating	2.48	5
Outing with family / children	2.2	30
Birdwatching / wildlife watching	2.10	43
Other	1.3	8
Kite surfing	1.0	1
Bait digging / cockling / crab tilling	0.63	7

Intertidal visitor routes

2.55 Not all visitor survey locations were directly on the shore, some were inland at car parks and on paths or tracks to the shoreline. Most visitor routes contained a urban aspect for example where the visitor had walked from home or parked on a road and walked to the shoreline, whereas other routes were entirely coastal where visitors had parked in a beach car park then headed straight to the shoreline. To link in with the additional elements of the Solent Disturbance and Mitigation project it is important to consider which visitor routes were taken across the intertidal areas as some visitors although they passed the shoreline remained on the Promenades and sea walls and others took routes onto the beach and across the intertidal areas. Visitor routes were categorised as follows;

- Routes which did not come within 25m of the MHWM are referred to as having no intertidal crossover and are non beach routes
- Routes which only remained within the distance band 25m above to 25m below the MHWM are those referred to as having no intertidal crossovers but beach routes
- Routes which crossed the 25m buffer below MHWM are referred to as those with intertidal crossover.

2.56 Routes that had an intertidal crossover were categorised further into distance bands dependent on how far the visitor went into the intertidal areas. These were categorised as:

- Greater than 25 m below and less than 50m below MHWM
- Greater than 50m below and less than 75m below the MHWM
- Greater than 75m below and less than 100m below the MHWM

- Greater than 100m below and less than 150m below the MHWM
- Greater than 150m below and less than 200m below the MHWM
- Greater than 150m below and less than 200m below the MHWM.

2.57 Of the 1310 routes analysed only 131 visitors and their 45 dogs were present in the no intertidal crossover and non beach route category. The remaining 1179 visitors and 505 dogs took routes which passed into the no intertidal crossover but beach route category. Of these visitors a total of 326 visitors and dogs then move from the beach route and into the intertidal crossover areas the majority of visitors who's routes take them into the intertidal areas are either dog walking or walking (Table 14).

2.58 Table 15 considers the percentage of each activity which occurs in the intertidal areas. Kite surfing and bait digging are activities which use the intertidal heavily, 79.2% of bait digging occurs in the intertidal area as does 80% of kitesurfing. However the sample sizes of these activities are small so can only provide an indication to the specific routes of visitors undertaking these activities. Dog walking and walking were the most frequently recorded activities in the intertidal areas (Table 14). In comparison to bait digging and kite surfing only 19.1% of dog walking routes and 23.3% of walkers routes takes places in intertidal areas.

Table 14. Comparison of the routes taken by visitors undertaking each activity. The values represent the number of visitors present in each intertidal zone by activity. It is assumed that the dogs were on a lead and followed an identical route to the dog walker.

Buffers around mean high water mark (m).	Dog Walking	Number of dogs	Walking	Bait Digging	Cycling	Kite surfing	Jogging	Family Outing	Boating	Bird / Wildlife watching	Other	Total number of visitors and dogs per intertidal zone
No intertidal cross over non beach route	55	45	75	1	2	0	1	5	7	14	1	206
-25 to 25m no intertidal cross over but beach route	544	505	554	4	18	3	7	20	5	13	11	1684
>25 and < 50	95	83	118	5	1	3	2	13	1	3	2	326
>50 and <75	20	11	32	4	1	3	2	9	1			83
>75 and <100	10	3	20	4	1	3	2					43
>100 and <150	4	1	12	3	1	3						24
>150 and <200	4	1	5	1								11
>200 and < 250	4	1	2	1								8
>250 and <500	4	1	2	1								8
Total intertidal routes (>25m and 500m)	141	101	191	19	4	12	6	22	2	3	2	503

Table 15. The number of visitors per activity in each intertidal zone expressed as a percentage of the total number of visitors undertaken each specific activity. The values can be used to identify the percentage of people potentially causing disturbance per activity within each intertidal zone. The table assumes the dogs are on lead and followed an identical route to the dog walker.

Buffers around mean high water mark (m)	Dog Walking	Number of dogs	Walking	Bait Digging	Cycling	Kite surfing	Jogging	Family Outing	Boating	Bird / Wildlife watching	Other
No intertidal cross over and non beach route	7.4	6.9	9.1	4.2	8.3	0.0	7.1	10.6	50.0	46.7	7.1
-25 to 25m (no intertidal cross over but beach route)	73.5	77.6	67.6	16.7	75.0	20.0	50.0	42.6	35.7	43.3	78.6
>25 and < 50	12.8	12.7	14.4	20.8	4.2	20.0	14.3	27.7	7.1	10.0	14.3
>50 and <75	2.7	1.7	3.9	16.7	4.2	20.0	14.3	19.1	7.1	0.0	0.0
>75 and <100	1.4	0.5	2.4	16.7	4.2	20.0	14.3	0.0	0.0	0.0	0.0
>100 and <150	0.5	0.2	1.5	12.5	4.2	20.0	0.0	0.0	0.0	0.0	0.0
>150 and <200	0.5	0.2	0.6	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>200 and < 250	0.5	0.2	0.2	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>250 and <500	0.5	0.2	0.2	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percentage of visitors within the intertidal area(>25m – 500m) per activity	19.1	15.5	23.3	79.2	16.7	80.0	42.9	46.8	14.3	10.0	14.3

3 Discussion

3.1 The results present a snapshot of recreational use across a wide range of coastal sites, encompassing a variety of beach types, habitats and types of location. The surveyed sites included ones with a very urban feel and others that were rural; some locations had large formal beach car-parks while others only had limited parking; some locations had wide sandy beaches while others were dominated by saltmarsh or mudflats. It is perhaps therefore not surprising that there was a wide variation across the sites in terms of the numbers of people recorded, activities undertaken and the motivation for visiting that specific stretch of coastline.

3.2 The visitor totals and number of interviews conducted reveal high levels of recreational use. The coast draws visitors from a wide radius- local and regional residents and holiday makers. The total number of interviews and number of people recorded at the sites, given that the surveys took place during the winter and that half the survey days were weekdays, is impressive.

3.3 A number of clear patterns have emerged from the on-site visitor surveys:

- 94% of people visiting the surveyed sites were local residents
- The most popular days to make a visit to the coast were weekends (with the number of visitors on a weekend day typically being around a third as much again as counted on a week day). The most popular time of day to visit was between 09:00 and 12:00.
- Walking was the most popular activity (44% of interviewees) and dog walking the second most popular (42% of interviewees). Dog walkers in particular tended to be regular visitors, with a quarter stating that they visit 'most days'.
- Visitor's motivation to visit a specific site varied depending on the interview location. The most popular response was 'close to home' where as one in five of interviewee responses commented on the attractive scenery and views.
- Visitors were also asked what features would be necessary to make another site attractive for use as an alternative to the site where they were interviewed and 34% of visitors indicated that nothing would deflect their use while 17% would be deflected by attractive scenery, 11% if the site were dog friendly and 11% if it were close to home.
- The split between how visitors arrived at the coast was quite well balanced with just over half of visitors (51%) arriving by car and 46% of visitors by foot. Half of all car visitors lived within 4.0km and 75% of car visitors lived within 9.1km of their interview location. Half of all foot visitors lived with 0.7km and 75% of foot visitors lived with 1.2km of their interview location. These distances did vary between site.
- The number of visitors to sampled stretches of coast was related to the number of houses around each access point.
- Models of car visitor rates using formal car parking provisions should also consider on road parking capacities within 500m of the access point.

3.4 While there was a wide range of activities recorded, two types dominated: walking and dog walking. The relative absence of visitors undertaking water-based activities is not surprising as only very proficient and keen users are likely to windsurf/kite surf/boat and kayak when the water is very cold, daylight is limited and weather/wind/tidal conditions are demanding. The 2009 / 2010 winter was particularly cold with mean (December-February) temperature of 1.6^{o}C , 2.1^{o}C below average and significant snowfalls occurred widely at times between mid December until the end of February[2]. It is possible that if the winter had been milder, more of these activities may have been recorded. It is also likely that the number of visits made to the shoreline was reduced because of the cold winter and hence the results of the visitor monitoring may not fully represent the true visitation patterns and so long-term average winter visitor pressure to the surveyed locations may be underestimated.

3.5 The extent to which people use intertidal areas could also be influenced by the weather; as such areas are potentially more exposed. The on-site visitor work is particularly useful in gathering information about specific routes and how far people do go within the intertidal, as these data are potentially particularly relevant to disturbance to birds and the relative impacts of different activities. Route data were gathered by asking each interviewee where they had been and the surveyor drawing a line on a map. These routes were then digitised within the GIS. It is inevitable that there will be some inaccuracies. While people walking along a seawall are unlikely to stray much from a path, people walking on a beach or below MHWM are likely to meander and in particular dogs off leads will potentially stray widely. The lines therefore capture where people have been but potentially will fail to capture the detail of where people have deviated from a particular route. In open beach/sandflat type situations, with few landmarks, the routes are perhaps likely to be the least accurate. In order to determine the degree to which people did filter out away from the MHWM we therefore used quite broad buffers from the MHWM (25m intervals).

3.6 The visitor monitoring has helped us identify where visitors come from to visit the coast, what activities they undertake, their motivation for visiting, how frequently they visit and what underlies people's choice of where they go. This understanding of visitation patterns is fundamental to underpin access management and green infrastructure provision in the future around the Solent. Such measures are important in order to ensure any impacts from recreation to the relevant European sites around the Solent are avoided or effectively mitigated. European sites are protected through the provisions of the Conservation of Natural Habitats and Species Regulations 2010 (SI no. 490), which transpose both the Habitats Directive (Council Directive 92/43/EEC) and the Wild Birds Directive (Council Directive 79/409/EEC) into UK law.

3.7 With respect to the impacts of access on relevant sites, Regulation 61 ensures that competent authorities can only agree to a plan/project which is likely to have a significant effect (alone or in-combination) after having determined that it will not adversely affect the integrity of any European site (subject to imperative reasons of

[2] http://www.metoffice.gov.uk/climate/uk/2010/winter.html

over-riding public interest and consideration of alternative solutions). Impacts associated with recreational activities that can be linked to plans or projects should therefore be avoided through the correct application of Regulation 61 by competent authorities. Regulation 61 applies to all European sites and therefore covers both SACs and SPAs (listed Ramsar features are also protected as a matter of government policy). New development and strategic development plans must therefore address any impacts of increased recreation to European sites.

3.8 Also relevant is Article 6(2) of the Habitats Directive, which requires Member States to take appropriate steps to avoid, in the SACs and SPAs, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated. 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.

3.9 A key issue to be taken into account in respect of recreational impact strategies associated with any new development is whether a credible link can be made between the potential impacts and development per se (and hence with a 'plan or project' as identified in regulation 61). The visitor modelling work will be crucial to make the links between cumulative development across a broad area and impacts to the three relevant SPAs.

3.10 It is not simply a matter of how far away visitors are drawn from on a regular basis; it is important to understand how access levels relate to disturbance, what proportion of residents (at a given distance) undertake visits which result in disturbance and to what extent that disturbance results in population impacts for the birds. Such answers will come in the further modelling and the combination of the on-site visitor work, the bird survey results and the household survey results. In the case of the Solent we have shown that the access patterns are complex – with each site attracting a different mix of people who are visiting for activities as diverse as the daily dog walk or kite surfing, and travelling different distances to undertake each activity.

3.11 Any strategies or approaches to mitigation will be robust when they are underpinned by the following:

- Identification of which types of activities result in disturbance
- A clear understanding of nature of these recreational activities
- The credibility of a link between such activities and development per se.

3.12 In this report we simply have addressed the second bullet, while the other work (the bird work and the household survey) will relate to the other bullet points. As the different threads of Phase II start to come together it should be possible to start pin-pointing relevant mitigation measures and understanding both how necessary and how effective they might be. Potential mitigation measures are listed in the Phase I report and some of the results presented here are helpful in appreciating how these might

work. People who choose sites that are close to home, where there is easy parking are perhaps likely to be easier to draw to alternative sites. People who have travelled considerable distances to undertake a specialist activity or who are drawn to the coast because of particular views or scenery are unlikely to want to go elsewhere – and therefore on-site measures will be necessary. Measures that involve the creation of new launching sites, or restrictions on existing ones, are likely to be effective for those visitors who are attracted to sites for these very reasons. For the first time we are in a position to actually estimate how many visitors may be influenced by such measures.

3.13 The analysis of the on-site visitor data has highlighted the need for the household survey and supports the approach of using both on-site and off-site surveys. The household survey will need to check the effect of the winter weather, and in particular clarify whether few people were undertaking water-based activities as a result of the cold weather. The results presented here also highlight the difficulty, when considering specific survey points, in relating visitor numbers to factors such as car-parking, especially where informal car parking is very difficult to quantify; in this case as a proxy measure we used the length of minor road within 500m of an access point. The extent to which the household survey and on-site surveys correlate, in terms of visitor rates, will be important in directing further analysis.

3.14 We have broken the coast up into a series of sections, and the household survey will generate a visitor rate to each of these sections. Many sections are quite broad and contain multiple access points. Our on-site work, for practical reasons, has focused very specifically on a sample of individual locations and access points, which hopefully will be representative of the use in the section as a whole. We envisage that the bird results will highlight the types of activity that need to be drawn out within the visitor analysis. With the results of the household survey it should be possible to relate housing (at different distance bands from each section) to the number of visitors. The on-site work results will then allow us to determine how these visitors spread out within each section and how many people go out onto the intertidal (where potentially there is the most likelihood of disturbance to birds occurring). The household survey will also ask people why they visit particular sites and whether they go onto the beach or mudflat or into/onto the water at each of those sites; this will provide further information on frequency of potential bird disturbance events.

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5 Appendix 1

Figure 16. Visitor survey recording sheet used for the Solent monitoring during Winter 2009/2010

Solent Visitor Survey

Good am / pm. Please could you spare me a few minutes to take part in a short survey about your visit today. The survey is being conducted for the Solent Forum.

Q1 Which of the following best describes your situation today? *Read list. Tick closest, single answer only*

	1 Away from home on holiday in the area
	2 Visiting from home on a day trip or short visit
	3 Visiting as part of work break
	4 Visiting from a friend's / relation's house
	5 Other: [note details below]:

Q2 What is the main activity you are undertaking today? *No prompt. Multiple answers ok, tick as appropriate to categorise.*

	1 Dog walking
	2 Walking
	3 Jogging/power walking/Nordic walking
	4 Outing with children/family
	5 Cycling
	6 Birdwatching / wildlife watching
	7 Windsurfing
	8 Kite surfing
	9 Boating (give details in free text)
	10 Bait Digging / Cockling / Crab tiling
	11 Canoeing / kayaking
	12 Fishing
	13 Short cut
	14 Kite flying
	15 Other/further detail:

Q3 How long have you spent / will you spend in the area today? *Tick closest, single answer only.*

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

Q4 Over the past year, roughly how often have you visited this area? By "this area" we mean this section of the coast from [location] to [location]? *Tick closest answer. Probe if interviewee struggles. Single answer only.*

	1: >180 visits *"Most days"*
	2: 40—180 visits *"1 to 3 times a week"*
	3: 15-40 visits "2 to 3 times per month"
	4: 6-15 visits *"Once a month"*
	5: 2-5 visits *"Less than once a month"*
	6: Don't know / first time
	Specific detail/no visits:

Q5 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

Q6 Do you tend to visit this area more at a particular time of year for [*insert activity*]**?** *Multiple answers ok*

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

Q7 How did you get here? *single answer only. Add if necessary:* **What form of transport did you use?** *Do not prompt. Categorise as appropriate.*

	1 Car / motorcycle		5 Horse
	2 On Foot		6 Bicycle
	3 Bus		7 By water (e.g. Boat, canoe etc).
	4 Train		

Free Text: other detail.

Q8 Aside from this location, do you visit any other places 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. Record locations. Code to section after interview, leave code blank where outside study area or inland. Leave blank if no locations named.*

		SECTION No.
	1:	
	2:	
	3:	

Additional details / sites / specific location:

Q9 What makes you come here, specifically, rather than another local site? *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 Don't know / others in party chose		9 Right place for activity (eg kite surf/fishing/ good for kids)
	2 Close to home		10 Particular wildlife interest
	3 Short travel time from home		11 Refreshments / Cafe / Pub
	4 Good /easy parking		12 Substrate type (e.g. Sandy beach)
	5 Feel safe here/safety issues		13 Good for dog/dog enjoys it
	6 Toilets		14 Suitability given weather conditions
	7 Choice of routes/ability to do different circuits		15 Ability to let dog off lead
	8 Attractive scenery/views		16 Particular launching facilities

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 ? *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. If relevant add tideline.*

Q10 Is/Was your route today a typical length for you when you visit this location for [*insert activity*]**?** *Single tick only, do not prompt, code as appropriate.*

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

Q11 What (if anything) influenced your choice of route here 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 Rainfall			6 Muddy tracks/paths	
	2 Daylight			7 Wind	
	3 Cold			8 Tide	
	4 Other users (i.e. presence of people)			9 Activity undertaken (e.g. presence of dog)	
	5 Time available			10 Particular members of group (e.g. kids)	

Free Text: other reasons / detail:

Q12 And in terms of this location, if the following changes were made, would you spend more or less time here for [*insert activity*]**?** *Read out each type of change in turn.*

	more	less	Neither / don't know	Comment
Site is busier with more people				
Better path surfacing / routing				
Parking charges or increased charges				
Dogs required to be on leads				
Presence of warden / beach manager				
Part of shore closed in areas sensitive for wildlife				

Q13 For [*insert activity*] **what features would be necessary to make another site attractive for you to use instead of here?** *Do not prompt. Categorise as appropriate.*

	1 No features / nothing			7 Measures to control other users	
	2 More dog friendly			8 Toilets	
	3 Better launching / access to water			9 Better / easier parking facilities	
	4 Better path surfacing / path network			10 Cheaper/free parking	
	5 Refreshments (e.g. cafe / pub)			11 Closer to home	
	6 Better information / maps / boards			12 Attractive scenery	

Free Text: other reasons / detail:

Q14 Do you have any other comments about this area?

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.

Q15 What is your full home postcode?
If unable/refusal to give postcode: **What is the name of the nearest village/town or if in a city the nearest district/suburb?** *Enter as much detail as possible to allow the location to be mapped.*

Q16 How many of your party fall into the following age categories? *Enter number*

	1 Under 18			3 41-65	
	2 18-40			4 Older than 65	

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

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