footprint ECOLOGY

Results of the recreational visitor surveys across the Humber Estuary

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Summary

This report provides visitor survey information relating to the Humber, with the aim of providing detailed visitor information to consider the impacts of recreation to the bird interest of the estuary and underpin considerations relating to the management of access. The fieldwork consisted of on-site visitor surveys, car-park counts, vantage point counts of people and targeted interviews with user groups.

On-site visitor surveys

A total of 614 face-to-face interviews were conducted with visitors at 20 different survey points, with the majority of fieldwork conducted during the winter November 2011 – March 2012). Eighty-eight percent of visitors interviewed were local residents visiting on a short trip or day trip from home. Dog walking was the main activity undertaken (40% of interviewed visitors) and other activities included walking (27% of interviews), wildlife watching (13%), family outing (3%), fishing (3%), airborne activities (3%), cycling (2%) and jogging (2%). Very uncommon activities (1% or less) included bait digging, kite surfing, and use of off-road vehicles. No one was interviewed who stated that their main activity was wildfowling, canoeing or windsurfing.

Most (70%) interviewees arrived at sites by car. Home postcodes indicated people travelling from their home lived a median distance of 4.4km from the survey point. Visitors interviewed during the summer tended to come from further afield than those interviewed during the winter. Blacktoft (RSPB) and Spurn tended to draw visitors from the widest catchment, while the survey point at Goole had the most local catchment. Dog walkers, walkers, cyclists, joggers and those undertaking airborne activities tended to be most local (i.e. those with home postcodes reflecting they lived particularly close to the survey points). Kite surfers (note small sample size) and wildlife watcher tended to draw people from particularly far away.

The main motivation for selection of sites to visit was closeness to home (29% of all interviewees), and other key factors included quick and easy travel route from home/accommodation (9%) and the particular wildlife interest (9%). Despite the high proportion of dog walkers interviewed, the fact that locations were good for the dog was given as a main reason for 3% of interviewees. Survey results indicated that people would visit sites less if they became busier (29% interviewees), increased parking charges/introduction of charging (29%) and if dogs were required to be on leads (27%), while both the creation of marked trails with interpretation (36%) and better path surfacing/routing (36%) would result in interviewees visiting more.

Route information (paper maps or GPS tracks) were collected to accompany 92% of interviews. Visitor routes were longer in the summer. Across both survey periods, jogging and cycling involved the longest routes and bait digging, dog walking and 'seeing the scenery' the shortest. Overall 18.5% of visitors who provided route information stated they walked off the paths and onto the mudflats or open beach.

Vantage point counts

Fifty-two vantage points providing views of the estuary and foreshore were each visited ten times (winter only) and all people and activities recorded and mapped. Activities recorded were broadly similar to the interviews, but indicated walking as the most popular (46% of people). Other activities (all 1% or more) included dog walking (25%), picnics (7%), kids playing (5%), fishing from embankment (4%), cycling (3%), birdwatching (3%), fishing from intertidal (2%), bait digging (1%), horse riding (1%) and people working on boat (1%). The vantage point counts shed light on the

geographic distribution of activities across the whole estuary and the relative levels of use. Of the surveyed locations, Cleeethorpes, Donna Nook, Hessle and the tip of Spurn were the areas with the highest concentrations of people.

Driving transects/Car-park counts

Ten transects of the whole estuary, counting all parked cars, were undertaken between August 2011 and March 2012.

The 189 mapped car parking areas contained 3691 spaces of which 3305 were formal spaces (car parks, hard standing or clear dedicated parking areas) and 386 informal spaces (comprising of pull in's and laybys). Overall 67% of the car parking spaces around the estuary are located on the south bank and 33% on the north.

Despite a higher number of car parking places and spaces on the south bank, a higher number of parked vehicles were actually recorded in the car parks on the north bank of the river (5129 for the south in comparison to 5371 on the north) over all ten transects.

A total of 10,500 cars, 43 vehicles with bike racks and 98 campervans were recorded in the car parks adjacent to the estuary. Over the late autumn/winter there was no significant difference in the number of cars at weekends compared to weekdays.

Targeted interviews with user groups/other information

On-line questionnaires and semi-structured interviews with a selection of people involved in angling, flying, wildfowling, kite surfing, sailing and wildlife watching provided additional information to supplement the face-to-face surveys conducted on site.

Implications in relation to disturbance

The visitor data are cross-referenced to bird data, and we map key sites for birds within the Special Protection Area (SPA). The fieldwork did not include detailed ornithological work, and so we refrain from identifying areas/activities that actually cause disturbance. Instead we take the approach of identifying areas where the visitor data shows access to coincide with key areas for birds. We summarise these below. Options for management are considered within the body of the report.

- The Saltfleetby area: dog walkers, walkers etc. in vicinity of hen harrier roost.
- Saltfleet: bait digging, wildfowling and dog walking around area used by feeding brent geese.
- Donna Nook: walkers and dog walkers in vicinity of area used by feeding brent geese and golden plover roost/feeding area.
- Horseshoe Point/the Fitties/Northcoates Point: dog walkers around autumn/winter golden plover & lapwing feeding sites/roost; kite surfers around tern roost (late summer) and brent goose feeding areas (winter). Wildfowling in areas used by brent geese and also autumn/winter golden plover & lapwing feeding sites/roost
- Cleethorpes: Dog walkers, walkers, kite surfers and horse riders in the vicinity of the wader roosts.
- Pyewipe: Fishermen and dog walkers in the vicinity of area used by feeding and roosting waders (both sides of sea wall). This area particularly important for black-tailed godwit November-January.
- Halton Marshes: dog walking, walking, wildfowling and fishing in vicinity of fields/marshes used by feeding/roosting golden plover, ruff, lapwing and curlew. Also key area for short-eared owls.

- Waterside/Pasture Wharf/Far Ings: dog walking, walking and wildfowling. The pits/marshes (inland of seawall) support breeding birds that include marsh harrier, bittern and avocet; winter/feeding area for a number of duck.
- Read's Island/Read's Island Flats: wildfowling, dog walkers along shore and water-craft (sailing) in channel. The area supports breeding avocet and marsh harrier; in winter range of species including pink-footed goose roost
- Winteringham Haven area: wildfowling, dog walking, walking in vicinity of autumn roost site for golden plover, lapwing, ringed plover, dunlin and curlew
- Alkborough Flats: dog walkers, walkers, joggers, wildlife watching, wildfowling. Area important for breeding birds (including avocet), wintering and on-passage.
- Faxfleet/Whitton Island: wildfowling, dog walking in vicinity of key area for birds, with bird interest including breeding birds (including marsh harrier and avocet), winter roost and feeding area in winter for range of wildfowl and waders
- Paull area: dog walking, walking, fishing around areas used by feeding black-tailed godwit in the autumn and winter roost/feeding site for redshank, lapwing and golden plover
- Cherry Cob Sands: relatively low numbers of shore based access (dog walking, walking) and wildfowling in vicinity of area used for winter feeding/roosting by large numbers of waders on fields/marshes (golden plover and lapwing) and intertidal.
- Stone Creek: wildfowling, dog walking and walking where salt marsh is important for short-eared owl in winter. This location also an anchorage point and therefore boat access potentially an issue.
- Patrington-Easington: relatively low levels of access but range of activities (dog walking, walking, wildfowling, bait digging) in vicinity of hen harrier/raptor roost, high tide wader roost and large expanse of mudflat important for feeding waders.
- Beacon Lagoons: beach activities, wildlife watching in vicinity of little tern colony and wader roost site
- Spurn Head: bait digging, walking, wildlife watching. Head holds wader roost and intertidal areas are used by feeding waders.

Contents

Summary 4

Contents 7

Acknowledgements 11

1. Introduction 12

The Humber, Designations and conservation interest 13

Disturbance 15

Aims, objectives and approach 17

2. On-site Visitor Survey 18

Introduction 18

Methods 18

Identification of survey locations 18

Structure of visitor survey 19

Visitor survey questionnaire 20

Visitor postcodes 20

Visitor routes 20

Data and analysis 20

Results 21

Survey effort 21

Number of interviewed groups 21

Visitor age categories 21

Visitor groups with dogs 22

Site busyness and season 22

Interview refusal rate 22

Local residents and holiday makers 22

Correlations between interviewed visitors and visitors entering the site 25

Group size 25

Dogs 26

Time spent at survey location 26

Seasonal variation in visitor patterns 27
Frequency of visit 28
Time of day 29
Comparison between weekday and weekend visitor patterns 30
Activities 30
Motivations for visiting particular survey locations 35
Visitors attitudes towards possible changes to locations 36
Other visit locations 37
Mode of transport to visit location 38
Transport and visit frequency 40
Home postcodes of interviewed visitors 41
Distance travelled 41
Distance and activities 43
Distance and transport mode 44
Visit frequency and dog ownership by postcode 47
Visitor Routes 48
Route length by activity 48
Route length by season and location 50
Distance straying from interview point 53
3. Vantage point counts 55
Introduction 55
Methods 55
Results 56
General 56
Per vantage point 56
Activities across the estuary 58
Comparison of visitor counts across the estuary 59
4. Driving transects - Car park counts 61
Introduction 61

Methods 61

Results 61

5. Other supplementary Information 66

Overview 66

Methods 66

Interviews 66

On-line questionnaires 66

Route information 67

Results 67

Angling- Interviews 67

Angling – On-line questionnaire responses 67

Angling – Other local comments 68

Sailing– Interview 68

On-line questionnaire responses – Sailing 69

Kitesurfing – Interviews 69

Wildfowling - Interviews 70

Aviation - Interviews 71

Wildlife and bird guided walks and courses - Interview 72

6. Visitor survey results in context with bird data and implications for management 75

Overview 75

Key areas for birds 75

Specific measures for the Humber 90

Airborne activities 90

Bait digging 90

Beach Activities 90

Dog walking 91

Fishing 91

Horse Riding 92

Kite surfing 92

Wildfowling....92
Wildlife Watching....92
General Measures....93
Additional research and monitoring....94
7. References....95
Appendix 1 – Visitor survey questionnaire....101
Appendix 2 – Angling responses to on-line questionnaire....102
Appendix 3 – Responses to on-line sailing questionnaire....110
Appendix 4: WeBS Sectors, Section Numbers and Site Names....121
Appendix 5: WeBS Sectors and Maximum Bird Counts....122
Appendix 6: Key Locations for Birds on the Humber....125

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1. Introduction

Overview

1.1 The Humber Estuary is internationally important for birds and is also a popular destination for recreation, involving a range of types of access. Recognising that there is scope for conflict where recreation and nature conservation interests coincide, and following recommendations in a previous report, this study involved visitor surveys to understand in more detail how people use the Humber for recreation. The fieldwork consisted of on-site visitor surveys, car-park counts, vantage point counts of people and targeted interviews with user groups. The results are considered in relation to the bird interest of the site, considering the implications in terms of disturbance issues and management of recreation on the Humber.

Context

1.2 A real and current issue for UK nature conservation is how to accommodate increasing pressure for recreation and access to the countryside without compromising the integrity of protected sites. Many of the sites that draw people for recreation, or provide access to the countryside are also designated for their nature conservation interest (Bathe 2007). In the past access and nature conservation have been typically 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 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; Maller *et al.* 2006; Pretty *et al.* 2007; Cutt *et al.* 2007; Moss 2012). Yet recreational use can have impacts on the nature conservation interest, and these impacts are now well documented (for general reviews see: Liddle 1997; Saunders *et al.* 2000; Penny Anderson Associates 2001; Newsome, Moore, & Dowling 2002; Buckley 2004; Penny Anderson Associates 2006; Lowen *et al.* 2008; Liley *et al.* 2010a).

1.3 Access patterns are changing. There is evidence that we visit the countryside more (TNS Research International Travel & Tourism 2010) and the human population is also increasing within England. The activities people undertake are changing. The first mountain bikes were only imported into the UK in the early 1980s (Palmer 2006) yet are now commonplace. In coastal environments, a range of activities are becoming increasingly popular (Brown *et al.* 2010), activities such as kite surfing , the use of personal watercraft (Whitfield & Roche 2007) and coasteering (Tyler-Walters 2005) are now widespread.

1.4 There is therefore the potential for conflict where there is pressure for recreational use and sites are of conservation importance, particularly where there are existing rights of access to those sites. The issues are often particularly acute in coastal areas, as coasts and estuaries 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. Managing the provision of access and maintaining the nature conservation interest often involves a difficult balancing act. Increasingly site management plans and local initiatives are developing ways to balance the issues, and there are a range of techniques available. In order to identify where and when management initiatives are necessary, and what measures to implement, good understanding is necessary at a site level. In order to achieve this understanding it is necessary to have information both on recreational use and the ecological issues (i.e. the impacts).

The Humber, Designations and conservation interest

1.5 The Humber is classified as an SPA in accordance with the European Birds Directive. This European legislation requires Member States to classify sites that are important for bird species listed on Annex 1 of the European Directive, which are rare and/or vulnerable in a European context, and also sites that form a critically important network for birds on migration. The Humber provides passage, overwinter, and breeding habitat for an array of species of European Importance; a vast and linked expanse of critically important habitat to the SPA network around the British coast.

1.6 In addition the Humber is classified as a Special Area of Conservation (SACs; designated for non-avian wildlife of European interest) and the estuary is also listed as a Ramsar site, in recognition of the international wetland importance under the Ramsar Convention[1]. It is common for sites to have these multiple designations. The boundaries do not quite coincide; the SPA contains the entirety of the Ramsar site, while there are a few parts of the SAC that lie outside the SPA.

1.7 Strict protection requirements apply to European sites, and the Member State duties for European sites, both SPAs and Special Areas of Conservation, are set out in Article 6 of the European Habitats Directive. Relevant duties have been transposed into UK legislation via the Conservation of Habitats and Species Regulations 2010 (SI No. 2010/490), commonly referred to as the Habitats Regulations.

1.8 It is important to note that the European legislation requires two key elements of protection. Firstly there is the overall duty to avoid the deterioration of European sites (Article 6(2) of the Habitats Directive), and secondly there is the duty to properly assess plans or projects that are likely to have a significant effect upon European sites, and only allow their implementation if the European site will not be adversely affected, unless further stringent tests apply (Article 6(3) and 6(4) of the Habitats Directive). There is therefore a duty to both prevent or rectify effects from existing impacts, and to ensure that further effects do not occur as a result of new potential impacts.

1.9 In complying with the Ramsar Convention, the UK Government treats listed Ramsar sites as if they are European sites, as a matter of national planning policy, as set out at

[1] Convention on wetlands of international importance especially as waterfowl habitat, Ramsar, Iran, 2/2/71 as amended by the Paris protocol of 3/12/92 and the Regina amendments adopted at the extraordinary conference of contracting parties at Regina, Saskatchewan, Canada 28/5 – 3/6/87, most commonly referred to as the 'Ramsar Convention.'

Section 118 of the National Planning Policy Framework 2012, and the legislation to protect European sites is therefore equally applied to the Ramsar listing. The relevant European site boundaries are shown in Map 2.1.

1.10 In addition to the European designations, the Humber is designated as a SSSI, reflecting the nature conservation importance at a nationally level. The SSSI is notified for a series of nationally important habitats that include the estuary itself (i.e. mudflats, sandflats and coastal saltmarsh) and the associated saline lagoons, sand dunes and standing waters. The site is also of national importance for the geological interest at South Ferriby Cliff (Late Pleistocene sediments) and for the coastal geomorphology of Spurn. The SSSI citation refers to nationally important numbers of 22 wintering waterfowl and nine passage waders, and a nationally important assemblage of breeding birds of lowland open waters and their margins. The SSSI is also nationally important for a breeding colony of grey seals *Halichoerus grypus*, river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus*, a vascular plant assemblage and an invertebrate assemblage.

1.11 The designations reflect the importance of the sites for birds, plants and invertebrates. Disturbance is, of course, a particular issue for birds and is therefore relevant to the SPA and Ramsar designations. The SPA includes the following individual species:

Breeding

- Little Tern *Sterna albifrons*,
- Marsh Harrier *Circus aeruginosus*.

Over winter

- Bar-tailed Godwit *Limosa lapponica*,
- Bittern *Botaurus stellaris*,
- Golden Plover *Pluvialis apricaria*,
- Hen Harrier *Circus cyaneus*.
- Dunlin *Calidris alpina alpina*,
- Knot *Calidris canutus*,
- Redshank *Tringa totanus*,
- Shelduck *Tadorna tadorna*

On passage

- Redshank *Tringa totanus*,
- Sanderling *Calidris alba.*

1.12 The SPA designation also qualifies for its 'waterfowl assemblage', regularly supporting 187,617 individual waterfowl including: Mallard *Anas platyrhynchos*, Golden Plover *Pluvialis apricaria*, Bar-tailed Godwit *Limosa lapponica*, Shelduck *Tadorna tadorna*, Knot *Calidris canutus*, Dunlin *Calidris alpina alpina*, Redshank *Tringa totanus*, Cormorant *Phalacrocorax carbo*, Dark-bellied Brent Goose *Branta bernicla bernicla*, Bittern *Botaurus stellaris*, Teal *Anas crecca*, Curlew *Numenius arquata*, Pochard *Aythya ferina*, Goldeneye *Bucephala clangula*, Oystercatcher *Haematopus ostralegus*, Ringed Plover

Charadrius hiaticula, Grey Plover *Pluvialis squatarola*, Lapwing Vanellus vanellus, Sanderling *Calidris alba*, Black-tailed Godwit *Limosa limosa islandica*, Wigeon *Anas penelope*, Whimbrel *Numenius phaeopus*.

1.13 The conservation objectives for the SPA are described by Natural England[2] and are:

"Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive.

Subject to natural change, to maintain or restore:

- *The extent and distribution of the habitats of the qualifying features;*
- *The structure and function of the habitats of the qualifying features;*
- *The supporting processes on which the habitats of the qualifying features rely;*
- *The populations of the qualifying features;*
- *The distribution of the qualifying features within the site."*

1.14 Webs alerts[3] indicate possible site-specific declines for the following species on the Humber: mallard, ringed plover, lapwing, sanderling and bar-tailed godwit.

Disturbance

1.15 Given the range of interest features and the conservation importance of the site it is clearly important to understand the current implications for disturbance and the likely future impacts. This is in a context of the implementation of improved coastal access, an increasing human population within the UK and development, which can result in a redistribution of people and marked increase in the local population living round sites.

1.16 Disturbance to birds is an area with a particularly large volume of literature, and is the focus of this contract. The issues with respect to the Humber are reviewed by Cruickshanks *et. al.* (2010a).

1.17 Studies have shown disturbance effects for a wide range of activities besides simply people, for example sudden noise (Wright, Goodman, & Cameron 2010), aircraft (Burger 1981; Conomy *et al.* 1998; Drewitt 1999), traffic (Reijnen & Foppen 1994; Reijnen *et al.* 1995a; Reijnen & Foppen 1995; Reijnen, Veenbaal, & Foppen 1995b; Reijnen, Foppen, & Meeuwsen 1996; Reijnen, Foppen, & Veenbaas 1997) and dogs (Lord *et al.* 2001; Randler 2006; Banks & Bryant 2007; Liley, Stillman, & Fearnley 2010b). Some types of disturbance are clearly likely to invoke different responses. In very general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group size) will both influence the response (Beale & Monaghan 2004). A number of recent studies of disturbance on different SPA sites around the English coast (Liley *et al.* 2010b, 2011; Liley & Fearnley 2011; Liley, D. & Fearnley, H. 2012) provide evidence that birds are more likely to respond to activities

[2] http://www.naturalengland.org.uk/Images/UK9006111-Humber-Estuary-SPA_tcm6-32298.pdf
[3] http://www.bto.org/sites/default/files/u18/downloads/alerts/uk9006111_species.pdf

that take place on the water or intertidal, where a dog is present, where the dog is off-lead and where the activities take the people close to where birds are present. Dog walking consistently appears to be the activity most frequently flushing birds.

1.18 Disturbance can have a variety of impacts. There are studies showing behavioural effects, such as birds changing their feeding behaviour (Fitzpatrick & Bouchez 1998; Verhulst, Oosterbeek, & Ens 2001; Thomas, Kvitek, & Bretz 2003), taking flight (Blumstein *et al.* 2003; Fernandez-Juricic *et al.* 2005; Webb & Blumstein 2005) or being more vigilant (Jacobsen & Ugelvik 1994; Ward & Low 1997; Randler 2005, 2006). Other studies have focused on physiological impacts, such as changes in the levels of stress hormones (Regel & Putz 1997; Tempel & Gutierrez 2003; Mullner, Linsenmair, & Wikelski 2004; Walker, Dee Boersma, & Wingfield 2006) or heart rate (Nimon, Schroter, & Stonehouse 1995; Weimerskirch *et al.* 2002; Nephew, Kahn, & Romero 2003). Despite this large body of work, there is still contention (Gill 2007) as it is often difficult to understand whether there is a real issue and what the population impacts might actually be. For example, the fact that a bird takes flight when a person approaches is to be expected and a short flight in unlikely to have a major impact on the individual in question, let alone the population as a whole. However, repeated flushing, over extended periods or in particular circumstances may have consequences for the population as a whole (West *et al.* 2002).

1.19 Certain impacts of disturbance are perhaps more likely to have a population impact. Direct mortality resulting from disturbance has been shown in a few circumstances (Liley 1999; Yasué & Dearden 2006) and many (but not all) studies have shown a reduction in breeding success where disturbance is greater (Ruhlen *et al.* 2003; Blackmer, Ackerman, & Nevitt 2004; Beale & Monaghan 2005; Murison *et al.* 2007). There are also many examples of otherwise suitable habitat being unused as a result of disturbance (Gill 1996; Liley 1999; Kaiser *et al.* 2006; Liley & Sutherland 2007). Very few studies have actually placed disturbance impacts in a population context, showing the actual impact of disturbance on population size (but see: West *et al.* 2002; Liley & Sutherland 2007; Mallord *et al.* 2007; Stillman *et al.* 2007; Kerbiriou *et al.* 2009; Stillman & Goss-Custard 2010).

1.20 Population impacts are not necessarily relative to the scale of disturbance (Liley & Sutherland 2007; Mallord *et al.* 2007), i.e. small changes in disturbance can result in disproportionately large impacts and vice versa. As described previously, behavioural responses may not necessarily describe the impact of disturbance at a population scale, with behavioural responses not necessarily reflecting the true impact of disturbance. In order to fully understand the implications of disturbance it is therefore necessary to consider the species' ecology, use of an area, habitat quality, prey abundance and other factors that may influence the scale of the disturbance. This information can then be used to identify what kinds of disturbance, at which locations, are likely to have an impact.

1.21 It is also important to understand the human use of the area in question. 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. If disturbance occurs only in a small proportion of a site some of the time, and the birds are free to move to other undisturbed areas, then disturbance is unlikely to have population consequences. A perspective at a site level is therefore important.

Aims, objectives and approach

1.22 Visitor survey work is therefore fundamental to an understanding of disturbance. Visitor survey data provides information on visitor numbers, activities undertaken, routes taken on site, where people come from and gives us an understanding of motivations for visiting. Such information, a site level, provides the opportunity to determine how busy sites are as a whole and can underpin strategic management decisions. Such visitor data has broad application as well.

1.23 Gaining a site wide perspective of access for an estuary such as the Humber is a challenge, given the scale of the estuary and the range of recreational pursuits that take place. This study aims to fulfil recommendations made by Footprint Ecology and others as part of initial desk-based work in 2010 (Cruickshanks *et al.* 2010). The overall aim is to understand in more detail patterns of access around the Humber. Key elements that are important to our understanding are the numbers of people visiting the estuary, how access levels vary around the estuary (both over time and space), the activities undertaken, where people travel from and how they use sites.

1.24 The following different approaches were utilised to gather information, and each forms a separate section within the report:

- On-site visitor surveys involving counts of people and interviews with visitors
- Vantage point counts, counting and mapping where people are
- Car park transects, counting parked vehicles around the estuary
- Targeted interviews / supplementary information with particular user groups

1.25 We also summarise the information about the bird interest and distribution of birds around the estuary, allowing bird and visitor data to be cross-referenced. This allows us to consider where there may be potential for impacts of recreation and potential to consider management of access in more detail.

2. On-site Visitor Survey

Introduction

2.1 This chapter details the methodology for and results from the 'on site' visitor monitoring element of the project.

Methods

Identification of survey locations

2.2 We initially identified 20 provisional survey sites. These were selected by taking the SPA boundary, and determining the length of shore along the from the south-east corner along the estuary and back out to Spurn (a distance of some 240km). The length of coastline was divided by the number of proposed survey locations. Dividing this length to give 20 evenly spaced survey locations gave a spacing of approximately 12km. The first survey location was therefore situated around 6km from the edge of the south-east corner of the SPA, the rest were assigned at approximately 12km intervals, using the nearest car-park in each case. Once the map was drawn, we reviewed the distribution of sites and relocated a number of survey points. Two points were moved from the western end of the SPA (where the SPA is narrow and therefore limited in area) to fill in gaps at the eastern end of the SPA. The final survey locations were agreed and approved by the project steering group and is shown in Table 1 and Map 2.1 (see Map Annex). All 20 locations were surveyed during the winter, and a sub-sample of four locations were covered in the summer (highlighted with an asterisk in Table 1). The summer visitor interviews at Spurn were undertaken at the car park just to the north of the gated entrance to Spurn tip and the winter surveys were conducted at the gated entrance.

2.3 Survey work at 18 locations was carried out by Footprint Ecology sub contractors. Location 2 (Saltfleet) and location 12 (Blacktoft Sands) were kindly surveyed by volunteers.

Table 1: Survey locations used for the Humber Management Scheme Visitor Survey. Locations are also shown in Map 2.1. All locations were surveyed during the winter. * indicates locations which were additionally surveyed in the summer.

Number	Location
1	Rimac*
2	Sea Lane, Saltfleet
3	Donna Nook*
4	Horsehoe Point
5	Cleethorpes (Discovery Centre)*
6	Oldfleet Drain, N. of Grimsby
7	Killingholme
8	East Halton
9	Barton-on-Humber
10	Ancholme/Opposite Read's Island
11	Alkborough Flats
12	Blacktoft RSPB
13	Goole

Number	Location
14	Faxfleet
15	Brough
16	Hessle
17	Paull
18	Patrington
19	Easington Bank
20	Spurn*

Structure of visitor survey

2.4 The visitor surveys comprised counts of people plus interviews with a random sample of visitors. Counts and interviews were designed to capture the range of recreational use believed to occur within each part of the site. Visitor surveys were conducted over two periods: summer (28th to 31st August 2011) and winter (19th November 2011 to 26th February 2012). All 20 sites were surveyed during the winter and a sample of four sites was surveyed during the summer.

2.5 At each location the surveyor undertook the counts and interviews in two-hour sessions, spread over a day to ensure visitor pressure was consistently recorded across all sites and sections between dawn and dusk. The timings of these sessions differed between the two survey periods to make the most of the available daylight. In the summer surveys interviews were conducted between 07:00 - 09:00, 10:00-12:00, 13:00-15:00 and 17:00-19:00 and in the winter they were conducted between 07:30 - 09:30, 10:00-12:00, 12:30-14:30 and 15:00-17:00. Each site was surveyed for two full days on both a week and weekend day. This methodology allows direct comparisons between visitor patterns across survey locations and also provided the surveyor with breaks.

2.6 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 noted. 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:

1) 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.
2) Surveyors carried photo ID and wore high visibility jackets.
3) No unaccompanied minors were approached or interviewed.
4) Surveyors carried business cards that were handed out to anyone wanting to check their identity.
5) Surveyors were polite and courteous at all times.
6) Surveyors were trained in the questionnaire and interview approach, ensuring standard sampling.
7) 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.

8) We aimed to avoid days with inclement weather and incorporated some flexibility into the fieldwork to allow for such days.

Visitor survey questionnaire

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

- Access points used
- Activities undertaken (multiple activities could be recorded)
- Route travelled on site and use of the intertidal
- Other parts of the area visited
- Knowledge about the designation of the site
- Opinions relating to management issues and potential changes
- Features that influenced choice of visit site
- Visitor profile: age, employment status, membership of local interest groups etc.
- Home postcode of the visitor and whether a local resident or visiting tourist

Visitor postcodes

2.8 The distance between each visitor's home postcode and the access point of the site they visited was analysed to provide an indication of the spatial distribution of where visitors came from. Each interviewed visitor to the Humber 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 database originating from Postzon and code point using Royal Mail Postcode Address File and Ordnance Survey Open data. As the visitor data consists of the group size for each interviewee it reflects the true number of individuals recorded by the visitor surveys.

Visitor routes

2.9 Information on visitor routes was collected using two methods: maps drawn by the surveyor in the field and small hand held GPS units. When drawing routes on to a paper map the surveyor made sure that the interviewee could orientate themselves and prompted the interviewees for landmarks along their route to ensure it was recorded accurately. The surveyors also carried a selection of aerial photographs and maps at different scales to use. The GPS units were given out at access points where the surveyor could be sure the person/group would be returning the same way (for example because their car was parked at the access point). Visitors which took a GPS unit were interviewed on their return to the survey location.

2.10 All routes were individually cross-referenced to each questionnaire. These data were subsequently digitised and MapInfo v10.0 was used to generate route lengths.

Data and analysis

2.11 Data analysis was conducted using Minitab (v14). Unless otherwise stated all errors are standard errors. Where applicable, 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.

Results

Survey effort

2.12 In the summer surveys 32 sessions were conducted at four sites over four days, equating to 64 hours of survey time. In the winter period 160 survey sessions were conducted at 20 sites over 40 days, totalling 320 hours. Therefore the combined survey effort was 384 hours of interviews and counts of people. Given that the summer surveys are a sample of the total winter coverage, we generally present the results of the summer surveys separately in each section.

Number of interviewed groups

2.13 A total number of 614 groups were interviewed (112 in the summer and 502 in the winter) which represents visitor information from 1154 visitors with 395 dogs (Table 2). The average group visitor size was 1.9 although this value varied between the survey periods, with larger groups of visitors recorded during the summer (Table 2).

Table 2: Summary table of survey coverage, number of interviews, groups and dogs. Data are absent for total people and groups entering the site for two of the summer locations as these were so busy that a total could not be maintained.

Survey period	Summer	Winter	Total
Number of survey locations	4	20	N/A
Number of interviewed groups	112	502	614
Total number of visitors interviewed	247	907	1154
Mean group size	2.2	1.83	1.9
Number of groups with dogs	46	226	272
Number of dogs recorded	60	335	395
Percentage of groups with dogs	41%	45%	44%
Mean number of dogs	1.3	1.5	1.5
Number of people entering the site	N/A	2177	N/A
Number of groups entering the site	N/A	967	N/A
Percentage of interview refusals from approached visitors	3.4%	16.7%	14.6%

Visitor age categories

2.14 Of the 614 visitor groups, 51% of people fell into 41-65 age groups category, 20% were between 18-40, 17% were older than 65 and 12% of the people in groups were under 18. There was a significant difference between the two survey periods in terms of the number of visitors in each age category (χ^2=40.2, 3df, p<0.001). Specifically, there were more young people visiting in the summer compared to the winter.

Visitor groups with dogs

2.15 A total of 44% (272) of interviewed groups of visitors had dogs with them which gives an average of 0.6 dogs per group of interviewed visitors across all survey locations and the equivalent of 0.3 dogs per person.

Site busyness and season

2.16 The highest number of summer visitor interviews was conducted at Cleethorpes Discovery Centre (location 5) where 38 interviews were completed (Table 3). In the winter surveys, the highest number of interviews (n=56) was conducted at Sea Lane, Saltfleet (location 2) while only four interviews were conducted at Easington Bank (location 19). Comparing the four locations surveyed in both periods, there was no significant difference in the number of interviews conducted between the two survey periods.

2.17 Accurate counts of people entering each site were collected at all 20 locations in the winter but this was not possible at Spurn and Cleethorpes (Discovery Centre) in the summer surveys due to the high number of visitors. Therefore we present total visitor counts for the winter data only in Table 2 and Map 2.2. Comparing the number of people entering the sites at Rimac (location 1) and Donna Nook (Location 3) (where full counts could be carried out in both seasons), there is a significant difference between the two periods (χ^2=69.7, 1df, p<0.001). Specifically there was a 16 fold increase in the number of people entering the site at Donna Nook in the summer survey.

2.18 The number of visitors recorded entering survey locations in the winter totalled 2177 and these visitors were in 967 different groups. The total number of people recorded entering each site over the eight survey sessions ranged between nine at Easington Bank and 344 at Sea Lane, Saltfleet.

2.19 Looking at the winter data only, there was a significant difference between locations in the number of visitors that were recorded entering each (χ^2=1699.29, 19df, p<0.001) suggesting that total visitor pressure may vary between locations.

Interview refusal rate

2.20 The average refusal rate across all the survey locations was low in the summer (3.4%) but quite high in the winter (17%) making the overall refusal rate 15%. The highest refusal rates were at Donna Nook (location 3; 67%) and Spurn (location 20; 53%). The overall refusal rate is higher than those observed in other recent visitor surveys (Fearnley, Clarke, & Liley 2010; Fearnley, Liley, & Cruickshanks 2011; Fearnley & Liley 2011).

Local residents and holiday makers

2.21 The majority of interviewed visitor groups (88% / 542) were local residents and had travelled to the site from their home (92% / 462 in the winter and 71% / 80 in the summer). 6.5% (40 groups) of interviewees were on holiday in the area and staying away from home and a further 3.3% (20 groups) were on a day trip or short visit and were staying with friends and family. The remaining 0.7% (4 groups) of visitors gave other reasons for their visit to the survey locations. Excluding the category 'other' there

was a significant difference in the proportion of visitors in each visitor type category (χ^2=99.4, 2df, p<0.001). As to be expected, more visitors were on holiday in the summer surveys compared to the winter surveys.

Table 3: Summary statistics from the visitor monitoring across 20 survey locations on the Humber during a winter survey (November 2011 and February 2012) and a summer survey (August 2011). * The summer interview sessions were undertaken at the car park to the north of the gated entrance to Spurn whist the winter surveys were undertaken at the gate.

Site code	Site Name	Number of interviewed groups	Number of visitors in interviewed groups	Mean group size	Number of groups with dogs	Number of dogs recorded	Percentage of groups with dogs	Number of people entering the site	Number of groups entering the site	Percentage of interview refusals from approached visitors
Winter surveys										
1	Rimac	29	52	1.8	15	21	52	92	43	36
2	Sea Lane, Saltfleet	56	153	3.0	20	32	36	344	121	2
3	Donna Nook	19	26	1.4	13	20	68	726	192	67
4	Horsehoe Point	19	30	1.6	13	31	68	34	23	5
5	Cleethorpes (Discovery Centre)	44	78	1.8	22	29	50	154	86	31
6	Oldfleet Drain, N. of Grimsby	10	15	1.5	5	6	50	21	17	38
7	Killingholme	6	9	1.5	2	2	33	10	7	0
8	East Halton	25	43	1.7	13	28	52	46	29	4
9	Barton-on-Humber	42	64	1.5	21	29	50	107	67	18
10	Ancholme/Opposite Read's Island	11	17	1.5	8	11	73	15	10	0
11	Alkborough Flats	13	24	1.8	4	8	31	16	10	0
12	Blacktoft RSPB	26	51	2.0	1	1	4	120	73	16
13	Goole	32	39	1.2	14	14	44	43	31	20
14	Faxfleet	11	16	1.5	9	17	82	19	12	0
15	Brough	37	61	1.6	14	20	38	46	23	3
16	Hessle	44	93	2.1	20	24	45	156	89	23
17	Paull	49	77	1.6	22	28	45	115	73	16
18	Patrington	10	17	1.7	8	12	80	13	9	9
19	Easington Bank	4	8	2.0	2	2	50	9	5	0
20	Spurn	15	34	2.3	0	0	0	91	47	53
Summer surveys										
1	Rimac	20	52	2.6	9	11	45	37	17	0
3	Donna Nook	29	51	1.8	19	27	66	45	26	0
5	Cleethorpes (Discovery Centre)	38	88	2.3	7	14	18	N/A	N/A	16
20	Spurn	25	56	2.3	11*	8	44	N/A	N/A	7

Correlations between interviewed visitors and visitors entering the site

2.22 Looking at the winter surveys only, there was a significant strong correlation between the number of visitors recorded entering each location and the number of people interviewed (Spearman's rank correlation co-efficient r_s=0.83, P<0.001 and Figure 1). This confirms that more interviews were conducted at sites with a higher number of visitors (Figure 1). This strong relationship also indicates a consistent level of monitoring between the fields surveyors and between the sites. The only outlier in the data set is Donna Nook where an extremely high number of visitors were recorded entering the site.

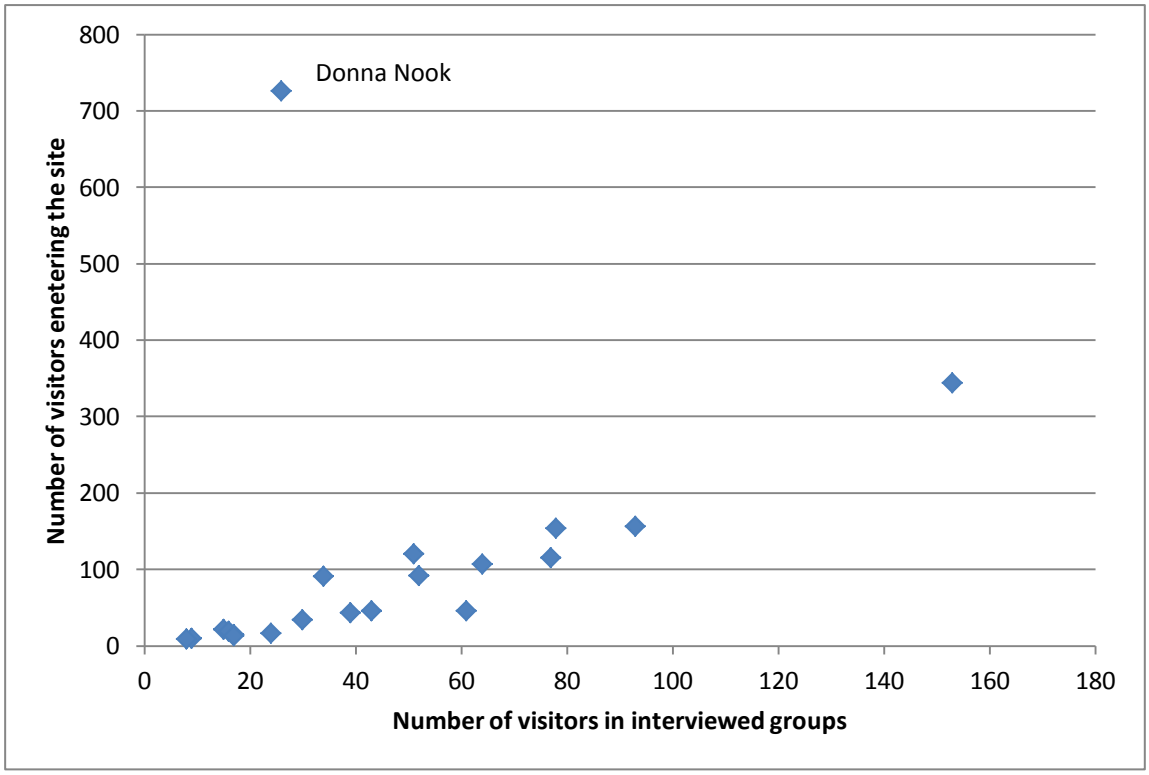

Figure 1: Shows the number of people interviewed at each survey location compared to the number of people recorded entering the same location.

Group size

2.23 The majority of interviews (45%) were given by visitors who were on their own. A further 38% of interviews were with interviewees who were in a group of two people and 16% of interviews captured information from groups of 3 or more people. There was a significant difference between the two survey periods in terms of group size (categories: 1 person, 2 people and 3 people or more, χ^2=200.39, 2df, p<0.001). Specifically in summer, fewer interviewed visitors made their trip alone and a higher number of visitors in larger groups were encountered.

Table 4: The number (%) of groups of different sizes interviewed in the summer and winter surveys.

Group size	Summer	Winter	Total
1	42 (38)	236 (47)	278 (45)
2	38 (34)	193 (38)	231 (38)
3	12 (11)	33 (7)	45 (7)
4	10 (9)	25 (5)	35 (6)

5	7 (6)	5 (1)	12 (2)
6	3 (3)	1 (<1)	4 (1)
7		1 (<1)	1 (<1)
13		1 (<1)	1 (<1)
35		1 (<1)	1 (<1)
No group size recorded		6 (1)	6 (1)
Total	112	502	614

Dogs

2.24 The visitor survey revealed that the Humber is used widely by dog walkers. Overall, 395 dogs were recorded (60 in the summer and 335 in the winter). Visitors with dogs were present at every survey location except at Spurn in the winter survey.

2.25 The percentage of groups accompanied by dogs varied between locations and seasons. During the winter survey, 45% of the groups interviewed had at least one dog with them. This decreased slightly in the summer when 41% had at least one dog with them. In the winter survey the highest percentage of interviewed groups with dogs was recorded at Faxfleet (location 14) where 82% of the 11 groups had dogs with them. The next most popular location for dogs was Patrington (location 18) where 8 out of 10 groups (80%) had dogs with them, followed by Ancholme/opposite Read's Island (location 10; 73%), then Donna Nook (68%) and Horseshoe Point (Location 4)(68%). The lowest number of interviewed visitors with dogs was recorded at Blacktoft RSPB (location 12) where 4% of groups were accompanied by dogs. In the summer survey the highest number of groups with dogs was recorded at Donna Nook (66%) and the lowest at Cleethorpes (Discovery Centre) with only 18%.

Time spent at survey location

2.26 All visitors were asked how long they spent or would spend in the area of the survey location. The results presented here includes local visitors travelling from home, people on a short trip staying with friends and also people on holiday in the area. In the summer survey the majority of groups (50%) spent between 1 and 2 hours in the area (Table 6) compared to the winter when the majority of visitors (49%) stay for less than 1 hour (Table 5).

2.27 The length of time people spent at an area varied with site. In the summer survey visitors to Spurn and the Discovery Centre spent the longest with 80% or more spending more than an hour compared to Rimac and Donna Nook where more than 95% of visitors stayed for less than 1 hour (Table 5). In the winter survey East Halton (location 8), Blacktoft RSPB and Spurn received longer visits with a high percentage spending more than 3 hours at the site. The shortest winter visits were made to Barton-on-Humber (location 9), Killingholme (Location 7) and Donna Nook (3).

Table 5: The percentage of interviewed groups spending different lengths of time at survey locations in the summer survey.

Survey location	Summer			
	Less than 1 hour	Between 1 and 2 hours	Between 2 and 3 hours	More than three hours

1	60	35	5	0
3	62	34	0	3
5	11	66	16	8
20	16	56	24	4
Total	34	50	12	4

Table 6: : The percentage of interviewed groups spending different lengths of time at survey locations in the winter survey.

Survey location	Winter			
	Less than 1 hour	Between 1 and 2 hours	Between 2 and 3 hours	More than three hours
1	52	38	10	0
2	46	46	5	2
3	63	32	5	0
4	47	32	11	11
5	57	41	0	2
6	30	40	10	20
7	67	17	0	17
8	56	16	0	28
9	76	17	0	7
10	45	27	27	0
11	8	62	23	8
12	4	27	31	38
13	59	25	6	9
14	55	27	0	18
15	51	41	8	0
16	41	43	14	2
17	49	31	6	14
18	60	40	0	0
19	25	75	0	0
20	27	7	47	20
Total	49	34	9	9

Seasonal variation in visitor patterns

2.28 Visitors were asked whether seasonality influences how frequently they visit the survey locations. The interviewees were able to select multiple answers (i.e. state that they visit the site regularly in more than one season). Out of a total of 650 responses from 614 interviewed visitors, most visitors stated that their visit patterns were not influenced by seasonality as they visited the survey location equally all year (Figure 2). In the winter surveys, 74% of visitors stated that they visit equally all year with 11% stating that they visit more in the winter. Of the summer visitors, 61% visited all year equally whilst 21% visited more in the summer.

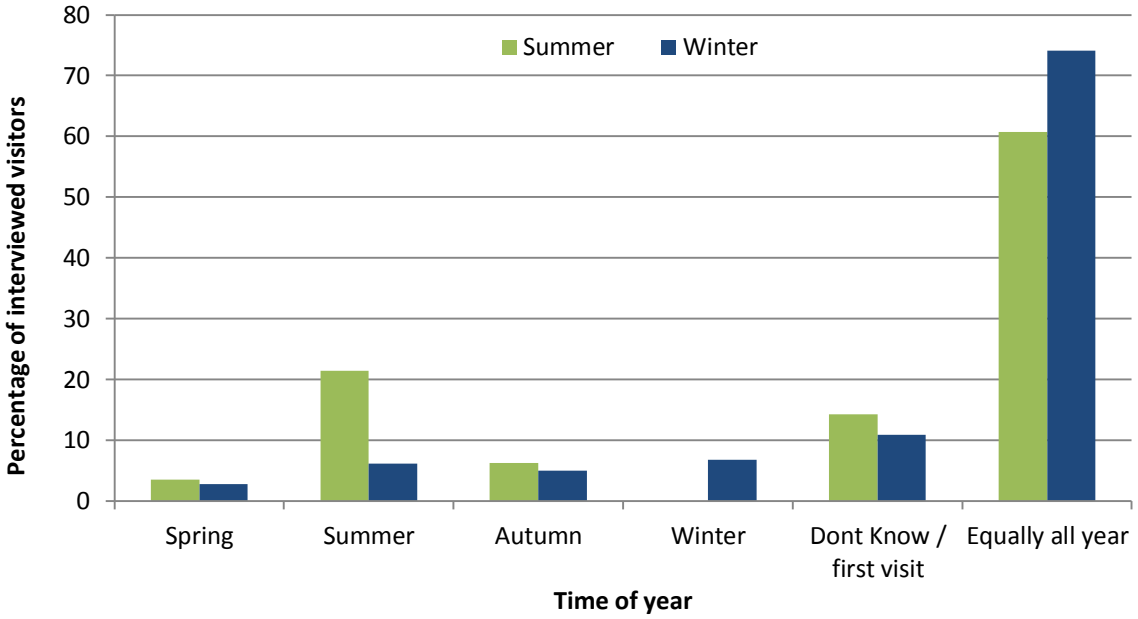

Figure 2: Seasonality of visits shown as a percentage of the total interviewed groups per survey period.

Frequency of visit

2.29 Visitors were asked how often they usually visited the survey location. Across the whole study the majority of interviewed visitors (21%) responding 'Daily'. Nearly equal numbers made a visit on most days (18%) or visited 1 to 3 times a week (20%) (Figure 3). Just under 60% of interviewed visitor groups made their visit at least once a week.

2.30 When drawing comparisons between seasonal visit patterns, we found that a higher percentage of winter visitors make more frequent trips and a higher percentage of summer visitors make less frequent trips (Figure 3).

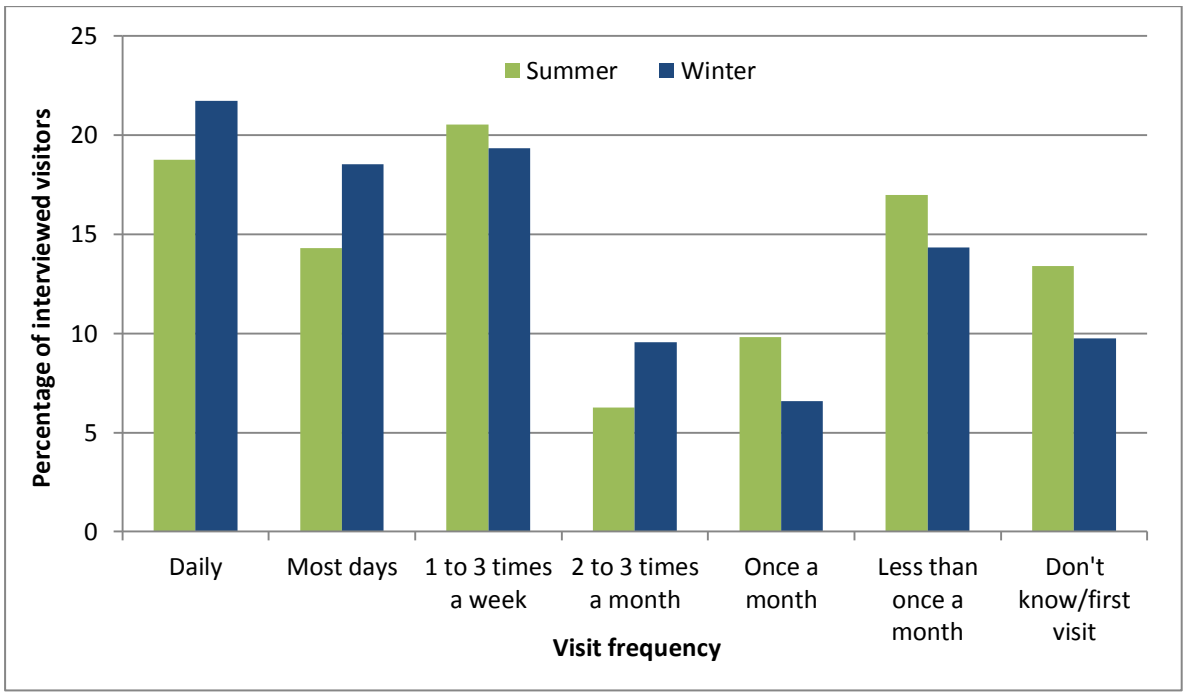

Figure 3: The percentage of visitors by their frequency of visit to survey locations.

2.31 Location 10 (Ancholme/Opposite Read's Island) and location 13 (Goole) had the highest percentage of daily visitors (Table 7). Location 10 (Ancholme/Opposite Reads Island) contained the highest percentage (73%) of visitors who's main activity was dog walking (Table 11) indicating that this site is well used by daily dog walkers from South Ferriby (Map 2.8). Half (50%) of all visitors to the location near Goole were walking and interestingly the median distance between a visitors home postcode and the interview location was 0.4km indicating this site is well used by daily walkers who live nearby.

Table 7: The percentage of interviewed visitors in the winter survey who visited each site categorised by visit frequency (percentage of total interviewed groups per survey location).

Survey location	Daily	Most days	1 to 3 times a week	2 to 3 times a month	Once a month	Less than once a month	Don't know/first visit	No response
1	10	24	14	10	3	17	21	0
2	23	4	14	2	2	34	21	0
3	37	26	11	0	5	11	11	0
4	26	5	21	5	16	16	11	0
5	32	25	23	5	9	5	2	0
6	10	50	30	0	0	10	0	0
7	17	17	50	0	0	0	17	0
8	20	20	24	20	0	12	4	0
9	29	19	2	10	5	17	19	0
10	45	9	0	18	9	18	0	0
11	8	31	15	23	15	8	0	0
12	4	4	12	4	19	42	15	0
13	44	31	19	6	0	0	0	0
14	18	36	9	9	9	9	0	9
15	11	27	30	14	5	3	11	0
16	23	20	25	9	11	7	5	0
17	16	8	33	18	8	14	2	0
18	30	30	30	10	0	0	0	0
19	0	0	50	25	0	0	25	0
20	0	13	7	20	7	27	27	0

Time of day

2.32 Visitors were asked whether they preferred to visit that location at a certain time of day. The majority of responses showed that most visitors did not have a preferred time of day to visit, although this percentage was higher in the summer (74%) than in the winter survey (45%) (Figure 4). A preference for morning visits was shown in the winter survey with a total of 55% of the responses stating that they tend to visit before midday compared to only 27% in the summer survey.

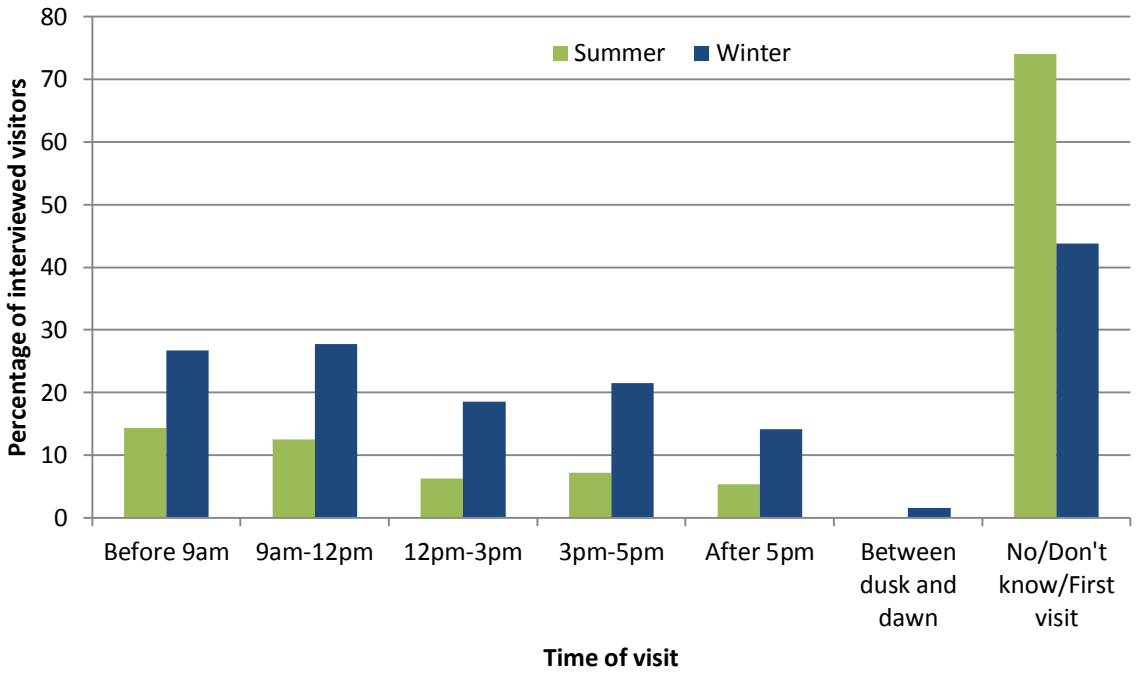

Figure 4: The percentage of visitors and the time of day that they tend to visit the survey location where they were interviewed.

Comparison between weekday and weekend visitor patterns

2.33 Survey effort across all locations was consistent between weekends and weekdays. However, of the 614 groups interviewed 52% (316 visitor groups) were interviewed on weekdays and 48% (298 visitor groups) on a weekend day. There was a significant difference in the number of interviews conducted at the weekend compared to week days between the two survey periods (χ^2=3.83, 1df, p=0.05). More interviews were conducted on week days in the summer surveys (60% compared to 50% in the winter). Whilst the number of interviews on a week and weekend was 50:50 in the winter surveys, the counts of the total number of visitors recorded entering each survey location is markedly different with 17% of the total (369 out of 2177) recorded on a week day and 83% counted at the weekend.

Activities

2.34 Visitors were asked about the main activity they undertook during their visit to the Humber, and any subsidiary activities. Overall, the most popular main activity undertaken was dog walking (40% of the interviewees). Walking was the most popular activity in the summer surveys (40%) and dog walking was the most popular in the winter (42%) (Table 8). Dog walking was the second most popular summer activity (31%), followed by 'outing with children/family' (9%) and then wildlife watching (7%). In the winter the second most popular activity was walking (24%) followed by wildlife watching (15%). Other activities recorded included bait digging (six individuals, one in the summer and five in the winter) and kitesurfing (four in the winter). Airborne activities (small planes etc.) were cited by 17 groups, and three groups used the interview location for driving off-road vehicles. Other main activities are shown in Table 8.

Table 8: The number (and percentage) of visitor responses for the two survey periods and overall when asked 'What is the main activity you are undertaking today?'.

Main visitor activity	Number of summer visitor responses (%)	Number of winter visitor responses (%)	Total number of visitor responses (%)
Dog walking	35 (31)	213 (42)	248 (40)
Walking	45 (40)	122 (24)	167 (27)
Jogging/power walking/Nordic walking	4 (4)	7 (1)	11 (2)
Outing with children/family	10 (9)	11 (2)	21 (3)
Cycling	6 (5)	9 (2)	15 (2)
Wildlife watching	8 (7)	74 (15)	82 (13)
Kitesurfing		4 (1)	4 (1)
Bait digging/cockling	1 (1)	5 (1)	6 (1)
Fishing		20 (4)	20 (3)
See the sea and enjoy the scenery	2 (2)	7 (1)	9 (1.5)
Meet up with friends		1 (0.2)	1 (0.2)
Off road/ vehicle access		3 (0.6)	3 (0.5)
Airborne activities	1 (1)	16 (3)	17 (3)
Total	112	502	614

2.35 Aside from the main activity, additional activities were given by 255 visitors and these are shown in Table 9. Visitors were more likely to state multiple activities in the winter than the summer surveys. In the winter, the most popular additional activity was walking, followed by wildlife watching. One visitor stated that wildfowling was an additional activity. Nine percent of interviewees described activities which could not be categorised and these are summarised in Table 10. The most frequently given activities were photography and seal watching followed by 'passing through' and feeding the ducks. One horse rider was interviewed, and a visitor teaching a gundog about the site.

Table 9: The number of visitors which stated that they were undertaking other activities in addition to their main activity. Percentages shown in brackets as a percentage of total interviewed groups.

Other visitor activities	Number of summer visitor responses (%)	Number of summer visitor responses (%)
Dog walking		28 (6)
Walking	2 (2)	66 (13)
Outing with children/family	2 (2)	7 (1)
Cycling		2 (0.4)
Wildlife watching	2 (2)	44 (9)
Bait digging/cockling/crab tiling		1 (0.2)
Fishing		5 (1)
See the sea and enjoy the scenery		31 (6)
Meet up with friends		7 (1)
Wildfowling	1 (1)	
Other	5 (4)	52 (10)

Table 10: The number of visitors which stated that they were undertaking other uncategorised activities.

Other activity (uncategorised)	Summer	Winter	Total
Photography	1	12	13
Seals		12	12
En route elsewhere/killing time	2	8	10
Feeding ducks		6	6
Visiting family/friends		3	3

Working on boat/caravan		2	2
Refreshments		2	2
Visiting Humber Bridge		2	2
Fitness		1	1
Horse riding		1	1
Interviewing birders		1	1
Managing reserve water levels		1	1
Picking elderberries	1		1
Picnicking	1		1
Teaching a gundog		1	1

2.36 There was some difference in activities between survey locations. At the majority of locations surveyed in the winter, dog walking was the main activity given by visitors. (Table 11 and Map 2.3). There were five locations where an activity other than dog walking was given by the majority of visitors interviewed and here wildlife watching (Sealane Saltfleet, Alkborough Flats (Location 11), Blacktoft RSPB and Spurn) and walking (Goole, location 13) were the most popular main activities. Walking and dog walking were equally popular at three further locations: Brough (Location 15), Hessle (Location 16) and Easington Bank.

2.37 In the summer survey, walking was the most popular activity at Rimac and Cleethorpes (Discovery Centre). At Spurn, wildlife watching was equally as popular as walking and dog walking was the most popular activity at Donna Nook (Table 11 and Map 2.4).

2.38 In the winter survey cycling was mainly taking place at Oldfleet Drain (locations 6), Goole and locations from Brough to Patrington). Kitesurfers were only interviewed at Horseshoe Point (Location 4) and bait diggers were only interviewed a Sea Lane Saltfleet, Horseshoe Point and Spurn. Visitors undertaking off road/vehicle access were interviewed at Alkborough Flats, Faxfleet (Location 14) and Patrington (Location 18). Airborne activities were reasonably widespread with interviewees taking part at half of all survey locations but the busiest was Killingholme (location 7) with 17 interviewees in the winter surveys. No visitors giving windsurfing, canoeing/kayaking or boating as a main activity were encountered.

2.39 Additional activities cited by visitors are summarised in Table 12. Generally, walking and wildlife watching were the most popular ‘other’. Wildfowling was stated as an ‘other activity’ at Donna Nook.

Table 11: The main activity undertaken at each site expressed as a percentage of the number visitors to each survey location stating their main activities.* The summer interview sessions were undertaken at the car park to the north of the gated entrance to Spurn whist the winter surveys were undertaken at the gate.

Location code	Dog walking	Walking	Jogging/power walking/Nordic walking	Outing with children/family	Cycling	Wildlife watching	Kite surfing	Bait digging/cockling	Fishing	See the sea and enjoy the scenery	Meet up with friends	Off road/ vehicle access	Airborne activities
Winter survey													
1	52	34	0	0	0	10	0	0	0	0	0	0	3
2	34	13	0	5	0	39	2	2	0	0	2	0	0
3	63	21	0	0	0	16	0	0	0	0	0	0	0
4	68	0	0	0	0	5	16	11	0	0	0	0	0
5	50	39	2	0	0	2	0	0	0	0	0	0	2
6	40	10	0	0	10	0	0	0	30	0	0	0	10
7	17	17	17	0	0	17	0	0	0	0	0	0	17
8	52	8	0	4	0	4	0	0	28	0	0	0	4
9	50	24	2	5	0	2	0	0	2	5	0	0	5
10	73	9	0	0	0	18	0	0	0	0	0	0	0
11	23	23	8	0	0	31	0	0	0	0	0	8	0
12	0	8	0	0	0	92	0	0	0	0	0	0	0
13	44	50	0	0	6	0	0	0	0	0	0	0	0
14	73	9	0	0	0	9	0	0	0	0	0	9	0
15	35	35	5	0	5	3	0	0	0	8	0	0	8
16	41	41	2	11	2	0	0	0	0	0	0	0	2
17	41	20	0	0	4	4	0	0	16	2	0	0	8
18	70	0	0	0	10	10	0	0	0	0	0	10	0
19	50	50	0	0	0	0	0	0	0	0	0	0	0
20	0	27	0	0	0	40	0	13	7	7	0	0	7
Summer survey													
1	35	40	0	15	0	0	0	0	0	5	0	0	5
3	48	38	3	7	3	0	0	0	0	0	0	0	0
5	24	47	8	11	8	0	0	0	0	3	0	0	0
20	20*	32	0	4	8	32	0	4	0	0	0	0	0

Table 12: Other activities stated by interviewees which are undertaken at each site. The values represent the number of responses given by the interviewed groups at each location – interviewees could undertake more than one of these activities.

Location code	Dog walking	Walking	Outing with children/family	Cycling	Wildlife watching	Fishing	See the sea and enjoy the scenery	Meet up with friends	Wildfowling	Other
Winter survey										
1		2			4		2			2
2	1	9		1	7		3	2		14
3		2			3		1			
4		2			1					
5		1	1		3					7
6				1						1
7	1				1		2			2
8	3	9	1		3	1	4			2
9	6	13	1		4		7			8
10		3			1		1	1		
11		5			3					1
12										4
13		1			3		2			
14					1					1
15	2				3		2	1		3
16		4	1		1		2	1		1
17	13	11	2		4	4	3	1		4
18	1							1		
19	1	3			2					1
20		1	1				2			1
Summer survey										
1			2		1					2
3		1							1	1
5		1								2
20					1					

Motivations for visiting particular survey locations

2.40 Visitors were asked what motivated them to visit the specific location at which they were interviewed rather than another local site. Distance to the location was the most frequently cited reason for choosing a particular location (see Table 13) (29% of visitors over the whole study, 21% in the summer and 31% in the winter). In the summer survey the second most popular reason (given by 15% of visitors) was 'quick and easy travel route from home/accommodation'. In the winter survey a high proportion of interviewees stated other reasons in their answer to this question (13%) or a factor was not given (11%). Only two visitors (0.3% of the responses) commented that good/easy car parking attracted them to their visit location (Table 13).

Table 13: The factor which most influenced each visitor to make a trip to the specific location where they were interviewed. Data are from visitor responses from all survey locations (percentage of total visitors interviewed is shown in brackets).

Main reason for visiting	Summer	Winter	Total
Don't know /others in the party chose	14 (13)	15 (3)	29 (5)
Close to home	24 (21)	156 (31)	180 (29)
Quick and easy travel route from home/accommodation	17 (15)	38 (8)	55 (9)
Good and easy parking	1 (1)	1 (0.2)	2 (0.3)
Particular facilities here	4 (4)	4 (1)	8 (1)
Choice of routes/ability to do different circuits		4 (1)	4 (1)
Quality of this area of coast	16 (14)	23 (5)	39 (6)
Rural feel	1 (1)	3 (1)	4 (1)
Quiet with no traffic noise	4 (4)	10 (2)	14 (2)
Habit/familiarity	4 (4)	15 (3)	19 (3)
Right place for activity	8 (7)	23 (5)	31 (5)
Particular wildlife interest	3 (3)	50 (10)	53 (9)
Ability to see boats/watch activities on the water		4 (1)	4 (1)
Good for dog /dog enjoys it	4 (4)	15 (3)	19 (3)
Ability to let the dog off the lead		6 (1)	6 (1)
Suitability of area given weather conditions		1 (0.2)	1 (0.2)
Refreshments / cafe/pub nearby		3 (1)	3 (0.5)
Closest coast to home	3 (3)	13 (3)	16 (3)
Not many people	1 (1)	2 (0.4)	3 (0.5)
Other		63 (13)	63 (10)
No answer	8 (7)	54 (11)	62 (10)
Total	112	502	614

2.41 When visitors were asked what secondary factors influenced their choice of site, 'close to home' and 'good for dog/dog enjoys it' were the most frequently cited factors (Table 14). 10% of winter survey respondents also gave 'quality of the coast' as an additional reason.

Table 14: Other factors which also influenced each visitor to make a trip to the specific location where they were interviewed. Data are from visitor responses from all survey locations (percentage of total visitors interviewed is shown in brackets).

Other reason for visiting	Summer	Winter	Total
Don't know / others in party chose		2 (0.4)	2 (0.3)
Close to home	6 (5)	97 (19)	103 (17)
Quick and easy travel route from home/accommodation	2 (2)	38 (8)	40 (7)
good and easy parking	11 (10)	36 (7)	47 (8)
Feel safe here		14 (3)	14 (2)
Particular facilities here		9 (2)	9 (1)
Choice of routes/ability to do different circuits	2 (2)	27 (5)	29 (5)
Quality of this area of coast	4 (4)	60 (12)	64 (10)
Rural feel		18 (4)	18 (3)
Quiet with no traffic noise	1 (1)	37 (7)	38 (6)
Habit / familiarity	2 (2)	56 (11)	58 (9)
right place for activity	1 (1)	31 (6)	32 (5)
Particular wildlife interest	4 (4)	40 (8)	44 (7)
Ability to see boats/watch activities on the water		20 (4)	20 (3)
Substrate type		3 (1)	3 (0.5)
Good for dog /dog enjoys it	3 (3)	62 (12)	65 (11)
Ability to let the dog off the lead		50 (10)	50 (8)
Suitability of area given weather conditions		5 (1)	5 (1)
Refreshments / cafe/pub nearby		8 (2)	8 (1)
Closest coast to home	3 (3)	20 (4)	23 (4)
Not many people		13 (3)	13 (2)
Other	15 (13)	82 (16)	97 (16)

Visitors attitudes towards possible changes to locations

2.42 Visitors were asked whether the duration of their visit would alter if specific changes were made to the location they visited. In general, visitors were unsure of how changes might affect their decisions. However 36% of visitors interviewed felt that better path surfacing and creation of marked trails with interpretation could increase the duration of their visit (Table 15). 29% of visitors indicated they would spend less time at a location if it were to become busier or if parking charges were introduced/increased. 27% of visitors said they would use the site less if dogs had to be kept on leads (Table 15).

Table 15: Responses given by interviewees in responses to any increase or decrease in the length of time they would spend at the survey location in responses to changes. Responses are expressed as a percentage of each change category and should be read by row.

Would you spend more time at the survey location if the following changes were made?	Unsure	Less	More
Site busier with more people	69	29	1
Creation of marked trails and routes with interpretation	61	3	36
Better path surfacing / routing	62	1	36
Increased or introduction of parking charges	70	29	1
Provision of formal parking	88	2	10
Dogs required to be on leads	68	27	5
Presence of warden/beach manager	89	3	9
Part of shore closed in areas sensitive for wildlife	79	11	10

Other visit locations

2.43 Interviewees were also asked whether they made visits to other places for similar purposes. The location of other given places was linked to each interviewee's main activity to look at use of other outdoor spaces. Combining the results for the two survey periods, the three most common main activities overall were dog walking, walking and wildlife watching and information on other locations visited for these three activities is given in Table 16). The most popular other locations for dog walking were Barton-on-Humber, Saltfleet Haven, Rimac and Tetney. Other popular locations for walking were Donna Nook and Spurn Head whilst at Far Ings, Spurn Head and Blacktoft Sands were popular for wildlife watching.

Table 16: The other places interviewees who cited dog walking, walking and wildlife watching as their main activity visit regularly for similar purposes. Numbers of responses and percentages of total responses (including all main activities) are shown in brackets. Only locations which had more than 5 responses are included in this table as an additional 186 locations were cited by only 1 or two interviewees. Responses such as 'local' and 'all coast' are excluded from this table.

Other locations	Dog walking	Walking	Wildlife watching	Total responses (including all main activities)
Far Ings	2 (8)	5 (20)	16 (64)	25
Spurn Head	2 (8)	7 (28)	14 (56)	25
Donna Nook	8 (33)	10 (42)	4 (17)	24
Barton on Humber	10 (50)	3 (15)	1 (5)	20
Saltfleet Haven	10 (53)	4 (21)	4 (21)	19
Rimac	10 (59)	5 (29)	1 (6)	17
Goxhill	6 (38)	5 (31)	1 (6)	16
Tetney	10 (63)	3 (19)	3 (19)	16
Blacktoft Sands		2 (13)	12 (80)	15
Cleethorpes	6 (43)	2 (14)	1 (7)	14
Hessle foreshore	8 (73)	3 (27)		11
Lincolnshire Wolds	5 (45)	6 (55)		11
Cleethorpes Country Park	8 (80)	2 (20)		10
Bempton Cliffs RSPB		1 (11)	8 (89)	9
North Cave			8 (89)	9
Paradise Car Park, Saltfleet	5 (56)	2 (22)	1 (11)	9
Waters Edge Country Park	6 (67)	1 (11)	1 (11)	9
Flamborough Head		2 (25)	6 (75)	8
Sunk Island	3 (38)	3 (38)	2 (25)	8
Alkborough Flats	3 (43)	2 (29)	2 (29)	7
Barrow Haven	7 (100)			7
Easington	4 (57)			7
East Halton	5 (71)	2 (29)		7
Humber Bridge Country Park	4 (57)	3 (43)		7
North Somercotes	5 (71)	2 (29)		7
Theddlethorpe	1 (14)	2 (29)	1 (14)	7
Ancholme River Walk	5 (83)	1 (17)		6
Mablethorpe	1 (17)	1 (17)	1 (17)	6
New Holland	4 (67)	1 (17)		6
Winteringham	3 (50)	2 (33)	1 (17)	6
Withernsea	4 (67)	1 (17)		6

Brough	3 (60)	1 (20)		5
Gibraltar Point		2 (40)	2 (40)	5
Horseshoe Point	3 (60)		1 (20)	5
Humberston	3 (60)			5
Paull	1 (20)	1 (20)	2 (40)	5
Seaview	3 (60)	2 (40)		5
Skegness	2 (40)	1 (20)	1 (20)	5

2.44 Visitors were asked what features would be necessary to make another site attractive for use instead of the location where they were interviewed. The interviewees were not prompted for a responses and more than one option could be given. Combining the results of the two survey periods, a total of 667 responses were made and the most frequent response was 'nothing' (53%) (Table 17).

2.45 Excluding these responses, the feature most frequently given was 'more dog friendly' (18% of responses) followed by 'closer to home' (15%), attractive scenery (15%) and 'better path surfacing/path network'(13%) (Table 17).

Table 17: Responses given by interviewees when asked what features would be necessary to make another site attractive for use an as alternative to the site where they were interviewed.

What features would be necessary to make another site attractive for you instead of here?	Number of responses	Percentage of total responses	Percentage of total responses excluding 'nothing'
Nothing	352	53	
More dog friendly	56	8	18
Better launching / access to water	10	1	3
Better path surfacing / path network	42	6	13
Refreshments (cafe/pub)	32	5	10
Better information / maps/board	4	1	1
Measures to control other users	8	1	3
Toilets	39	6	12
Better / easier parking	14	2	4
Cheaper/ free parking	16	2	5
Closer to home	48	7	15
Attractive scenery	46	7	15

Mode of transport to visit location

2.46 Seventy percent of all interviewed visitors (428 groups) travelled by car/van, 26% (161) arrived on foot, 3% (19) by bicycle and less than 1% travelled by public transport, by water or by other means (including by horse and by motorhome). Comparing the three main categories (car/van, on foot, and bicycle) between seasons, there is no significant difference between the two survey periods in the type of transport used (χ^2=2.194, 2df, p>0.05).

2.47 The 428 groups who arrived by car/van comprised of 861 individuals which equates to an average number of 2.01 visitor per vehicle.

Table 18: The mode of transport used by visitors to the Humber. The values per transport category are expressed as a percentage of the total number of interviewed visitors by each transport mode in the two survey periods and overall.

Survey	Car/van	On foot	Public transport	Bicycle	By water	Other	No response	Total
Summer	79 (71)	27 (24)		6 (5)				112
Winter	349 (70)	134 (27)	1 (0)	13 (3)	1 (0.2)	2 (0.4)	2 (0.4)	502
Total	428 (70)	161 (26)	1 (0.2)	19 (3)	1 (0.2)	2 (0.3)	2 (0.3)	614

2.48 In the winter surveys, visitors arrived exclusively by car at Horseshoe Point, Faxfleet and Easington Bank (Table 19 and Map 2.5). Visitor arrived by foot at 15 other locations and bicycle at eight locations. Public transport was only used by interviewees visiting Hessle. At Ancholme/opposite Read's Island and Goole, foot access was the main mode of transport in the winter survey.

2.49 In the summer surveys, all visitors interviewed at Rimac arrived by car, whereas a higher proportion of visitors to Cleethorpes Discovery Centre (58%) arrived by foot (Table 19, Map 2.6).

Table 19: The mode of transport used by visitors to the Humber. The values per transport category are expressed as a percentage of the total number of interviewed groups per location who arrived by each transport mode (divided into each survey period).

Location	Car/van	On foot	Public transport	Bicycle	By water	Other	No response	Total
Winter								
1	26 (90)			2 (7)	1 (3)			29
2	42 (75)	13 (23)		1 (2)				56
3	18 (95)	1 (5)						19
4	19 (100)							19
5	26 (59)	18 (41)						44
6	6 (60)	2 (20)		2 (20)				10
7	4 (67)	2 (33)						6
8	23 (92)	2 (8)						25
9	26 (62)	16 (38)						42
10	4 (36)	7 (64)						11
11	9 (69)	4 (31)						13
12	24 (92)	1 (4)				1 (4)		26
13	2 (6)	26 (81)		2 (6)			2 (6)	32
14	11 (100)							11
15	25 (68)	10 (27)		2 (5)				37
16	23 (52)	19 (43)	1 (2)	1 (2)				44
17	35 (71)	11 (22)		2 (4)		1 (2)		49
18	9 (90)			1 (10)				10
19	4 (100)							4
20	13 (87)	2 (13)						15
Summer								
1	20 (100)							20
3	28 (97)			1 (3)				29
5	13 (34)	22 (58)		3 (8)				38
20	18 (72)	5 (20)		2 (8)				25

2.50 Figure 5 and Figure 6 and Maps 2.5 and 2.6 show the number of interviewed visitors using different types of transport at each location in winter and summer respectively.

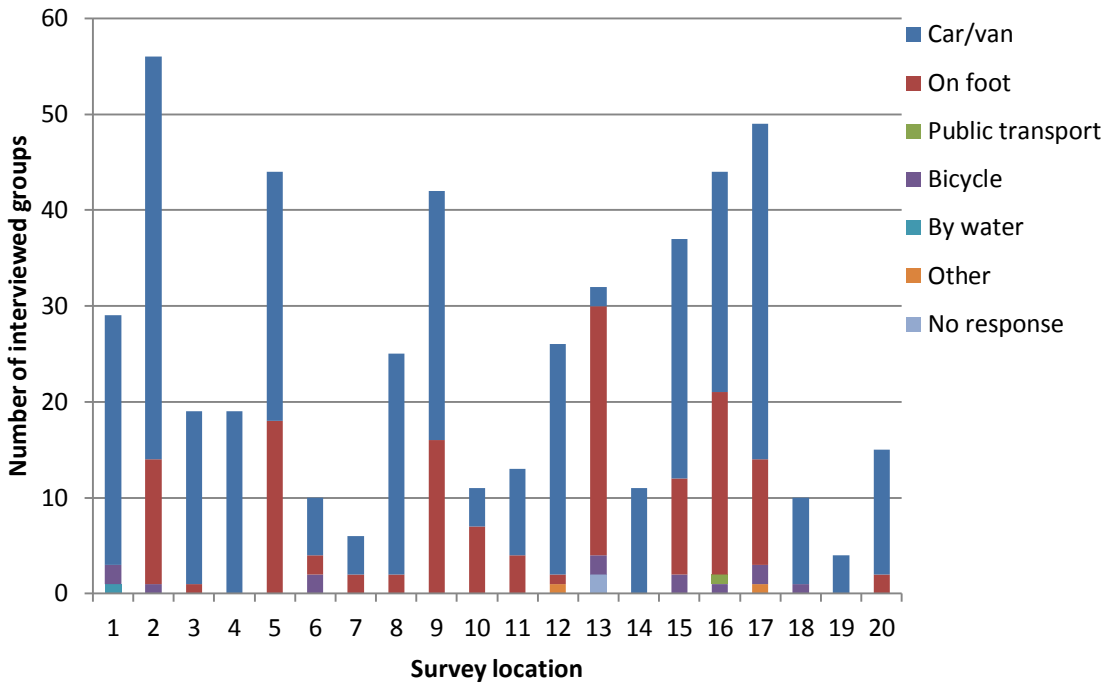

Figure 5: The number of interviewed groups in the winter surveys arriving at each location by different modes of transports.

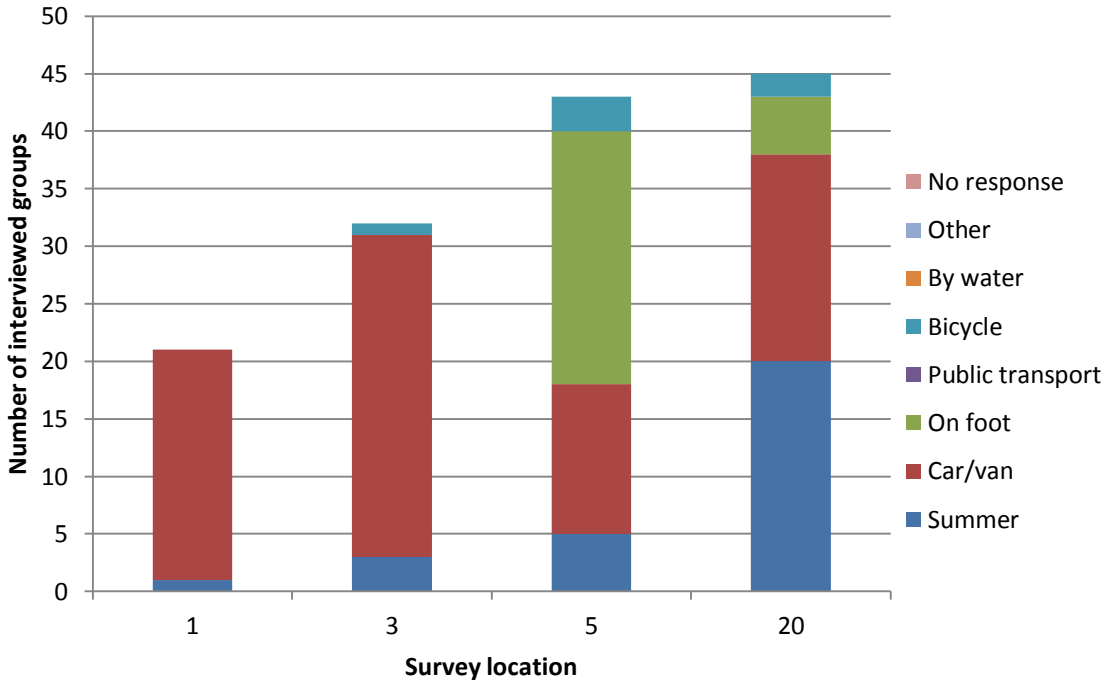

Figure 6: The number of interviewed groups in the summer surveys arriving at each location by different modes of transports.

Transport and visit frequency

2.51 Less than a third (29%) of all visitors arriving by car/van to the Humber visited daily or most days compared to 68% of foot visitors (Table 20). Therefore whilst a lower

number of visitors make recreational trips to the Humber by foot, individually these visitors will make more visits to the area than the greater number of visitors who arrive by car, and visit less frequently.

Table 20: Number and percentage (in brackets) of interviewed visitors by visit frequency and transport type.

Mode of transport	Daily or most days	Less frequently than daily or most days	No response	Total
Car/van	122 (29)	305 (71)	1 (0.2)	428
On foot	109 (68)	52 (32)		161
Public transport		1 (100)		1
Bicycle	5 (26)	14 (74)		19
By water	1 (100)			1
Other		2 (100)		2
No response	2 (100)			2
Total	239 (39)	374 (61)	1 (0.2)	614

Home postcodes of interviewed visitors

2.52 A total of 552 visitor questionnaires included valid home postcodes and were successfully geocoded. Of the 62 that were not geocoded, 22 interviewees had named the nearest town/village where they lived. These 22 were added manually within the GIS, using the OS 250,000 scale gazetteer to locate the central point of each settlement. In total therefore we could be confident of the origin of 574 of the interviewed visitors and these are show in Map 2.7.

Distance travelled

2.53 Those visiting from home tended to live much closer to the location where interviewed (median distance 4.42km, n=513) compared to those staying with friends or family (median=125.3km; n=15) or those on holiday in the area (median=102.73km; n=34) (Kruskal Wallis H-118.28, $p<0.001$).

2.54 Visitors appeared to travel different distances to different survey locations (Table 21, Map 2.8). In the winter survey, Blacktoft RSPB attracted visitors from the largest catchment area (50% of visitors lived within 50km) whereas visitors to (Goole) were much more local (50% of interviewees lived within 0.4km). In the summer survey, Spurn attracted visitors from the furthest distances whilst Cleethorpes Discovery Centre had the most local catchment with 50% of visitors travelling from within 4.2km (Table 21). Generally, locations that are less well publicised for particular activities and that are closer to settlements (e.g. Brough, Goole and Hessle) attracted visits from a smaller catchment (i.e. 50% of car visitors live within 5km) (Table 23).

Table 21: Median, minimum and maximum travel distances from survey locations to home postcodes of visitors interviewed in each period (based on 574 geocoded postcodes).

Survey location	Median	Minimum	Maximum	Number of responses
Winter				
1	9.7	0.8	102.9	23
2	13.3	0.2	213.5	48
3	3.3	1.1	33.1	17
4	8.1	1.6	229.2	18
5	1.6	0.3	211.1	40
6	5.2	3.0	9.7	10
7	14.2	3.4	212.0	6
8	5.6	2.8	38.3	24
9	2.1	0.1	196.9	37
10	1.4	0.5	14.4	11
11	6.4	1.2	62.1	13
12	49.9	7.3	202.4	25
13	0.4	0.04	10.6	29
14	9.1	5.5	40.5	11
15	2.3	0.4	62.4	36
16	1.9	0.1	155.5	43
17	4.3	0.2	93.7	49
18	2.6	0.1	3.3	10
19	13.8	7.7	21.5	4
20	30.8	4.3	147.4	12
Summer				
1	14.4	2.4	296.2	19
3	9.8	2.9	168.1	29
5	4.2	0.6	154.4	35
20	56.1	9.3	166.5	25

2.55 There was some seasonal difference in travel distances. At the four survey points that were surveyed in both summer and winter, day visitors travelled from further afield in the summer (summer visitors median distance = 8.47km (n=79); winter median = 4.42 (n=83); Mann-Whitney U=5.53; p=0.019) (Figure 7).

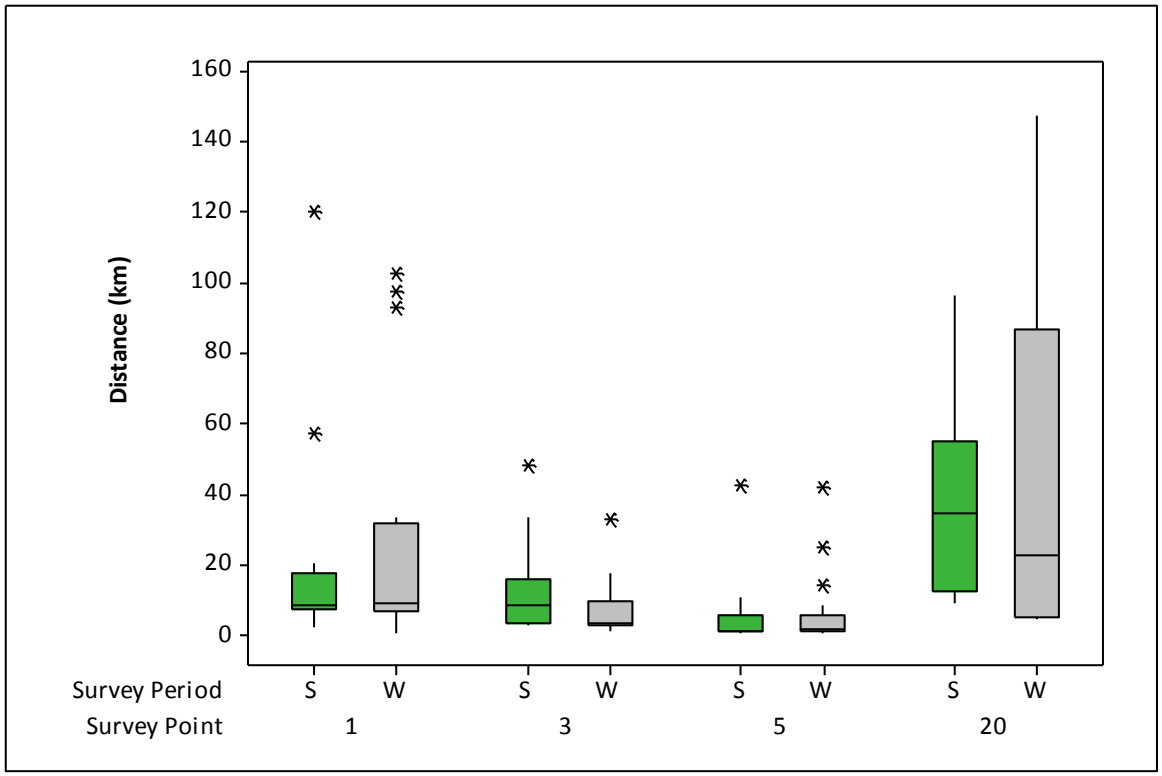

Figure 7: Comparison of distance from home postcode to survey point for interviews in the summer ('S', green boxes) and winter ('W', grey boxes). Data for those people undertaking day trips from home only.

Distance and activities

2.56 The combined data from both winter and summer surveys suggest that visitors travel different distances to undertake different activities. Half of visitors who were dog walking lived within 3km of their visited location whereas half of visitors who were 'wildlife watching' lived within 40.5km of their chosen visit location (Figure 8, Table 22). This suggests that visitors are willing to travel further to sites which are more suited to their chosen activity (children's facilities, opportunities to wildlife watch and fish).

2.57 In general, dog walking, walking, jogging, cycling and airborne activities were the activities which were undertaken closest to home by visitors (Figure 8). Visitors undertaking kitesurfing and off-road vehicle activities travelled from relatively far away (but note the low sample size for these activities). Specifically, 50% of the kitesurfers interviewed (n=4) lived within 48.5km and median distance travelled by visitors using off road vehicles (n=3) was 31.5km illustrating the wider appeal of the site for these activities.

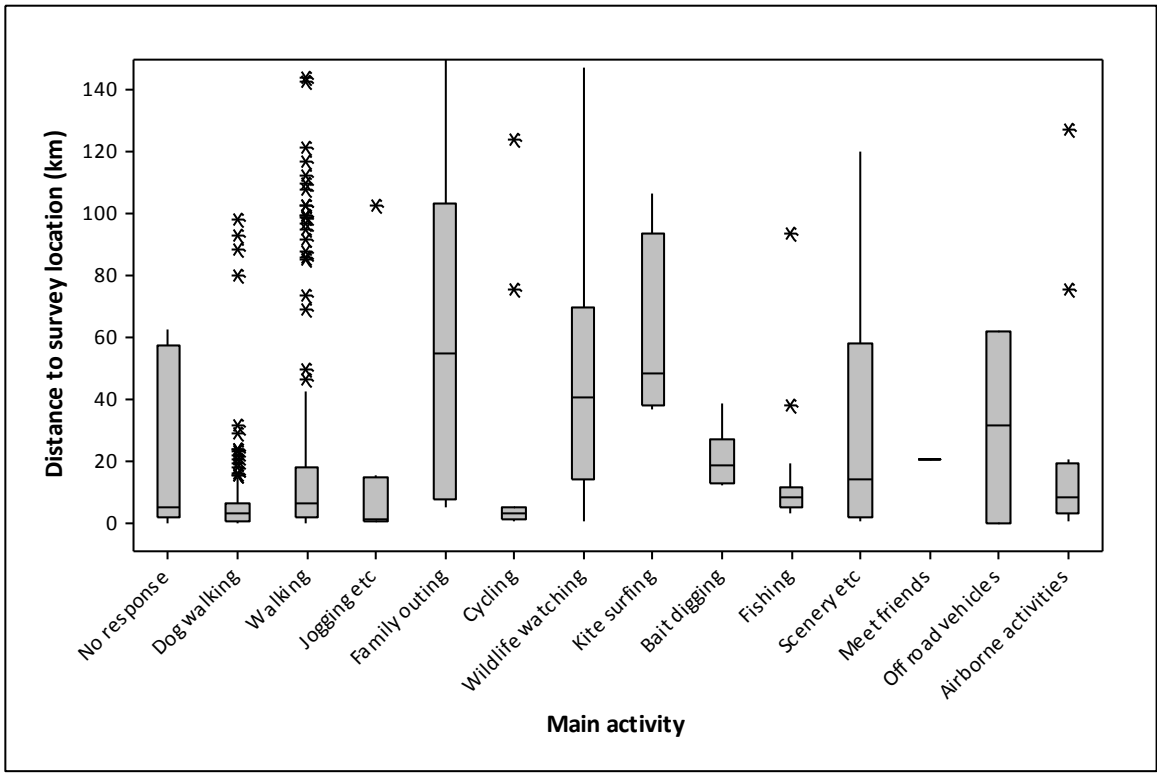

Figure 8: Linear distance between interview location and the visitors home postcode, grouped by the main activity undertaken during their visit (winter and summer surveys combined). The graph has been truncated at 150km. Illustration of the data presented in Table 22.

Table 22: Linear distance (km) from visitors home postcode to survey location grouped by main activity undertaken.

Main activity	Median	Minimum	Maximum	Number of responses
No response	5.2	0.2	212	9
Dog walking	3	0.04	229.2	241
Walking	6.5	0.2	296.2	149
Jogging/power walking/Nordic walking	1.5	0.8	102.7	11
Outing with children/family	55	5.4	168.1	18
Cycling	3.6	0.4	166.5	15
Wildlife watching	40.5	0.5	213.5	73
Kitesurfing	48.5	37.1	106.6	4
Bait digging/cockling	18.7	12.2	38.8	6
Fishing	8.8	3.4	93.7	19
See the sea and enjoy the scenery	14.6	0.8	120.4	8
Meet up with friends	20.7	20.7	20.7	1
Off road/ vehicle access	31.5	0.1	62.1	3
Airborne activities	8.6	0.4	155.5	17

Distance and transport mode

2.58 Figure 9 shows the distance between visitors' home postcodes and the interview location, categorised by transport mode. Visitors who arrived by car/van travelled a greater distance to visit their chosen location in comparison to those who arrived by foot or bicycle (note that visitors arriving by public transport and other unspecified categories were omitted due to small sample sizes). While it appears that some visitors on foot and by bicycle travelled long distances, this is because they were on holiday in

the area and the distance given is to their home postcode rather than to their local accommodation.

2.59 Table 23 details the distances travelled between the home postcode of visitors and interview locations. Absent values in the table reflect the small sample size. From figures 10-12 it can be seen that 50% of interviewed visitors on foot lived within 0.95km, 50% of visitors who travelled by car lived within 8.4km and 50% of visitors who travelled by bicycle lived within 3.5km of their visit locations.

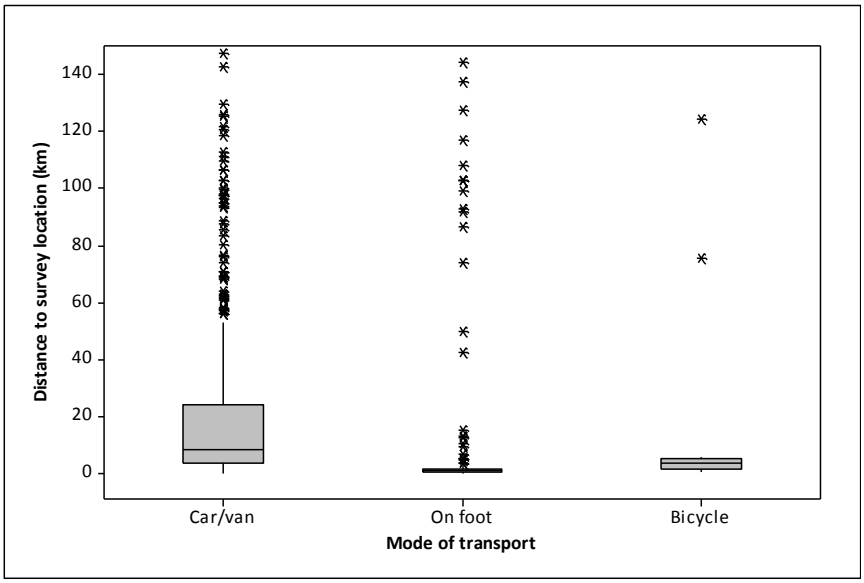

Figure 9: Linear distances travelled from visitors home postcodes to the interview location using different transport modes. The graph excludes public transport and 'other' due to small sample sizes and has been truncated at 150km.

Table 23: Distances (km) travelled to each survey location according to transport mode, including the 1st quartile (25%), median, 3rd quartile (75%), minimum and maximum distances for each transport mode and survey location.

Location	Car/van						On foot						Bicycle					
	25%	Med.	75%	Min	Max	N	25%	Med.	75%	Min	Max	N	25%	Med.	75%	Min	Max	N
1	8.2	13.7	90.9	0.8	296.2	41						0		2.2		2.2	2.2	1
2	7	20.7	76.5	0.2	213.5	35	0.2	0.4	0.5	0.2	0.6	13						0
3	3.3	6.5	16.6	2.6	168.1	44		1.1		1.1	1.1	1		3.6		3.6	3.6	1
4	3.6	8.1	21.5	1.6	229.2	18						0						0
5	2.1	5.5	9.5	0.4	211.1	37	0.8	1.2	2.9	0.3	154.4	35	1.3	3.7	75.6	1.3	75.6	3
6	3.9	4.7	6.6	3	9.7	6		5.3		5.2	5.4	2		5.4		5.2	5.6	2
7	3.5	10.4	163.3	3.4	212	4		14.2		13.0	15.3	2						0
8	3.2	6.7	8.8	2.8	38.3	23		2.8		2.8	2.8	1						0
9	2	9.7	24.1	1.1	196.9	23	0.3	1.0	1.5	0.1	74.1	14						0
10	4.9	9.6	14.4	4.9	14.4	4	0.7	1.1	1.4	0.5	2.9	7						0
11	5.1	10.9	14.9	1.5	62.1	9	1.2	1.3	1.3	1.2	1.3	4						0
12	25.1	49.9	69.4	7.3	202.4	23		9.3		9.3	9.3	1						0
13		1.6		1.4	1.8	2	0.3	0.3	1.0	0.04	10.6	23		0.9		0.4	1.4	2
14	6.1	9.1	19.6	5.5	40.5	11						0						0
15	1.5	5	9.2	0.7	62.4	24	0.4	0.7	2.3	0.4	5.2	10		1.4		0.8	2.1	2
16	2	4.8	11.7	1	155.5	22	0.6	0.8	1.1	0.1	3.8	19		1.9		1.9	1.9	1
17	3.9	6.3	8	0.5	93.7	35	0.3	0.4	3.3	0.2	6.9	11		4.4		4.3	4.5	2
18	2.2	2.6	3.3	0.1	3.3	9						0		2.6		2.6	2.6	1
19	8.1	13.8	20.7	7.7	21.5	4						0						0
20	10.2	38.5	79.4	4.3	147.4	28	99.1	102.8	127.6	12.7	144.0	7		145.4		124.2	166.5	2

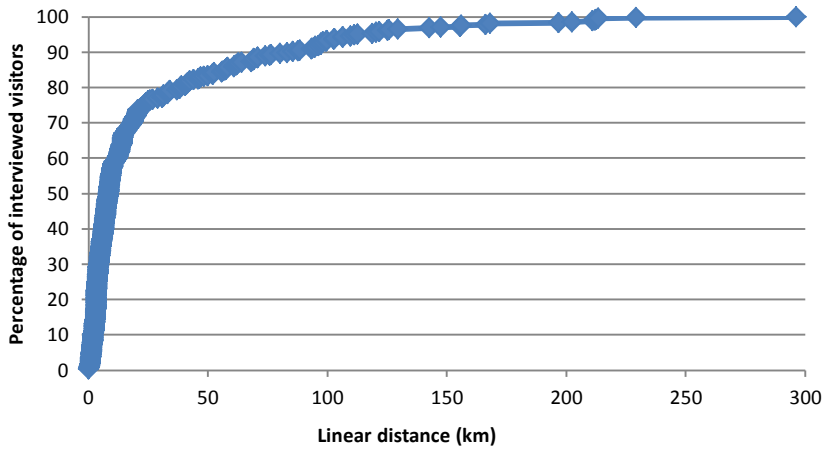

Figure 10: Cumulative frequency distribution of the linear distance by car from the interviewed visitors' home postcode to the survey location.

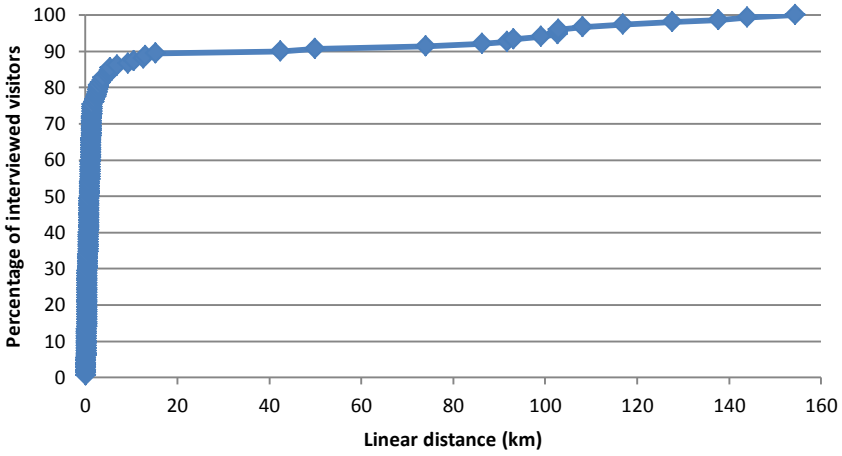

Figure 11: Cumulative frequency distribution of the linear distance by foot from the interviewed visitors' home postcode to the survey location.

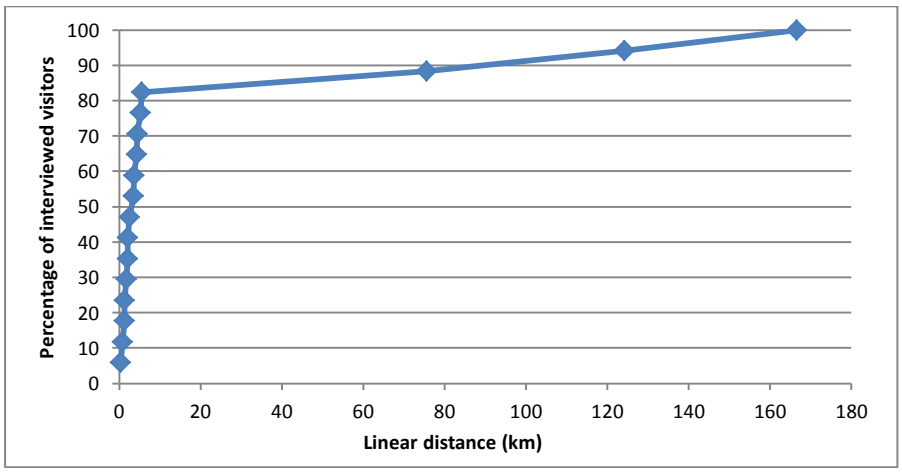

Figure 12: Cumulative frequency distribution of the linear distance by bicycle from the interviewed visitors' home postcode to the survey location.

Visit frequency and dog ownership by postcode

2.60 Interviewee visit frequency was considered on a per postcode basis and the spatial data illustrates that visitors with postcodes nearer to survey location have a higher visit frequency (Map 2.11).

2.61 Map 2.12 shows the postcode locations of visitors who were accompanied by dogs. More visitors were interviewed who were not accompanied by dogs than visitors who were accompanied by dogs. Looking at the spatial distribution of dog ownership by postcode, people accompanied by at least one dog tend to live closer to the Humber (Kruskal-Wallis; H=92.54, 1df, p<0.001). Furthermore, this relationship still holds when considering interviewees visiting from home only (rather than including those on holiday) (H=64.23, 1df, p<0.001).

Visitor Routes

2.62 A total of 562 routes followed by visitors at interview locations were mapped from the 614 interviewed visitors, so routes were gathered for 92% of all groups interviewed (93% in the summer survey and 87% in the winter). Slightly fewer than 8% of visitor routes (44 routes) were collected using GPS units and the remaining routes were mapped on paper. Both sets of routes were digitised. Here we consider whether route length varied according to main visitor activity, with location and between the two survey periods.

Route length by activity

2.63 Combining routes collected in the two survey periods, there was a significant difference in route length when categorised by main activity (Kruskal Wallis H=57.27 10df, p<0.001, 'See the scenery etc.', off- road access, and interviews with no response were excluded from this analysis because of the small sample size). As would be expected cyclists undertook the longest routes with 50% of interviewees covering at least 7.59km in the summer surveys (Table 24). In the winter surveys, joggers and cyclists undertook the longest routes (median values 4.78km and 4.43km respectively).

2.64 Bait digging,' see the sea and enjoy the scenery' and fishing (winter only) had the shortest route lengths but given the small number of visitor responses in these categories, the route lengths associated with these activities may not be representative. This also applies to the single visitor who stated his/her main activity was to meet with friends (Table 24). Visitors who were kitesurfing and undertaking airborne activities provided relatively short route lengths and this represents the fact that the routes provided show the distance walked to start the activity, rather than the routes taken during the activity.

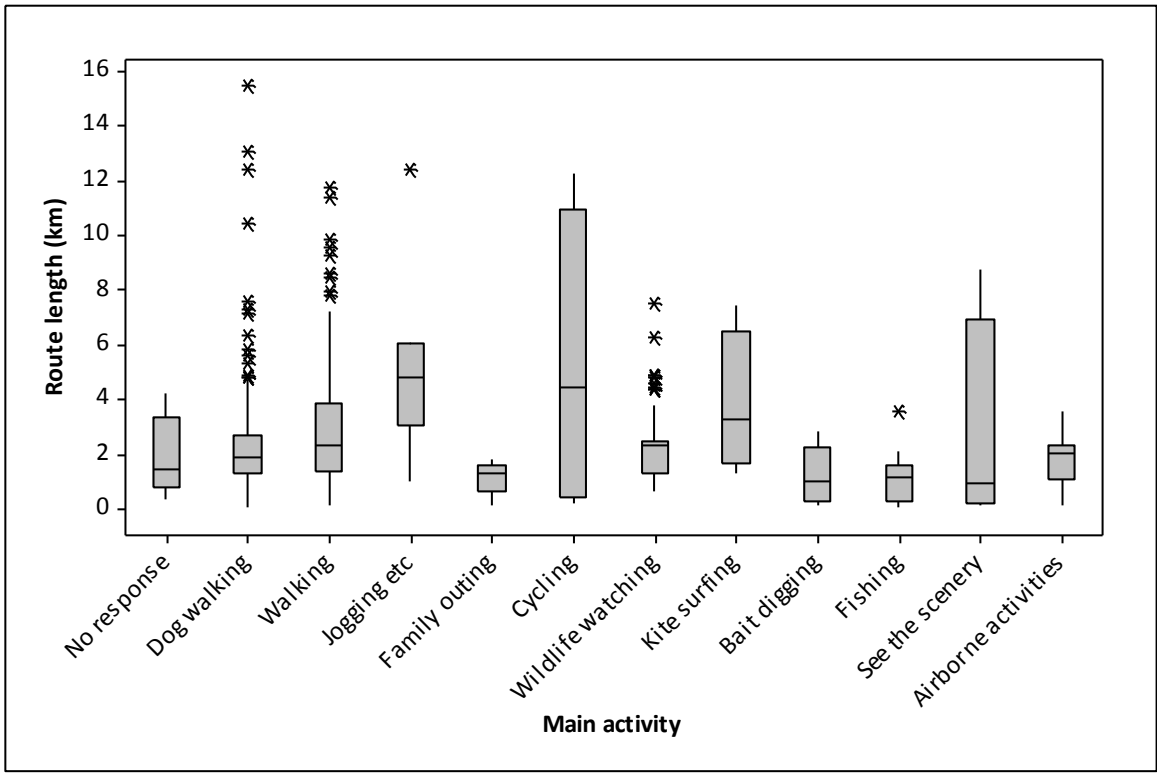

Figure 13: Route length (km) of visitors per main activity category in the winter survey.

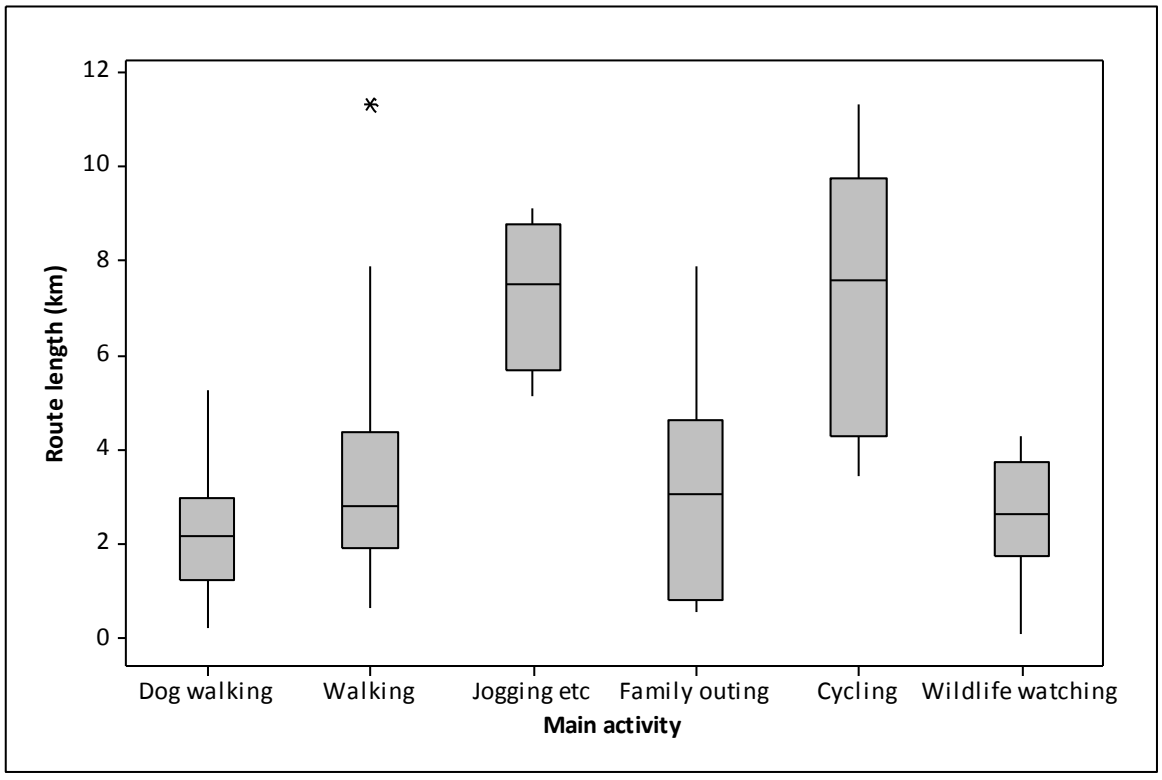

Figure 14: Route length (km) of visitors per main activity category in the summer survey.

Table 24: Visitor route length (km) per main activity category where N= number of interviewed visitors.

Main activity	Mean	Median	Minimum	Maximum	N
Summer					
Dog walking	2.15	2.16	0.21	5.28	29
Walking	3.28	2.8	0.62	11.34	39
Jogging etc	7.33	7.51	5.14	9.14	4
Outing with family/children	3.11	3.05	0.53	7.88	10
Cycling	7.30	7.59	3.43	11.34	6
Wildlife watching	2.58	2.62	0.08	4.31	6
Bait digging	0.6	0.6	0.6	0.6	1
See the scenery etc	2.36	2.36	1.71	3.01	2
Winter					
No response	1.87	1.39	0.31	4.19	8
Dog walking	2.34	1.86	0	15.51	211
Walking	3.04	2.29	0.08	11.75	113
Jogging etc	5.03	4.78	1	12.39	7
Outing with family/children	1.11	1.30	0.13	1.75	9
Cycling	5.44	4.43	0.2	12.23	8
Wildlife watching	2.31	2.27	0.6	7.46	66
Kite surfing	3.79	3.23	1.3	7.4	4
Bait digging	1.17	0.96	0.11	2.77	5
Fishing	1.11	1.13	0.04	3.57	12
See the scenery etc	2.68	0.93	0.13	8.73	4
Meet up with friends	1.55	1.55	1.55	1.55	1
Off road access	2.63	2.63	1.42	3.83	2
Airborne activities	1.79	2.03	0.09	3.52	14

Route length by season and location

2.65 Visitor routes were significantly longer in the summer (summer median = 2.76km (n=97); winter median = 1.68 (n=115); Kruskal Wallace, H=16.1, DF=1; p<0.001) (Figure 15).

2.66 There was a significant difference between the four locations surveyed in the summer (Kruskal Wallace, H=46.3, DF=3; p<0.001). Specifically the longest summer routes were recorded at Cleethorpes Discovery Centre whilst the shortest summer routes were recorded at Rimac (Figure 15).

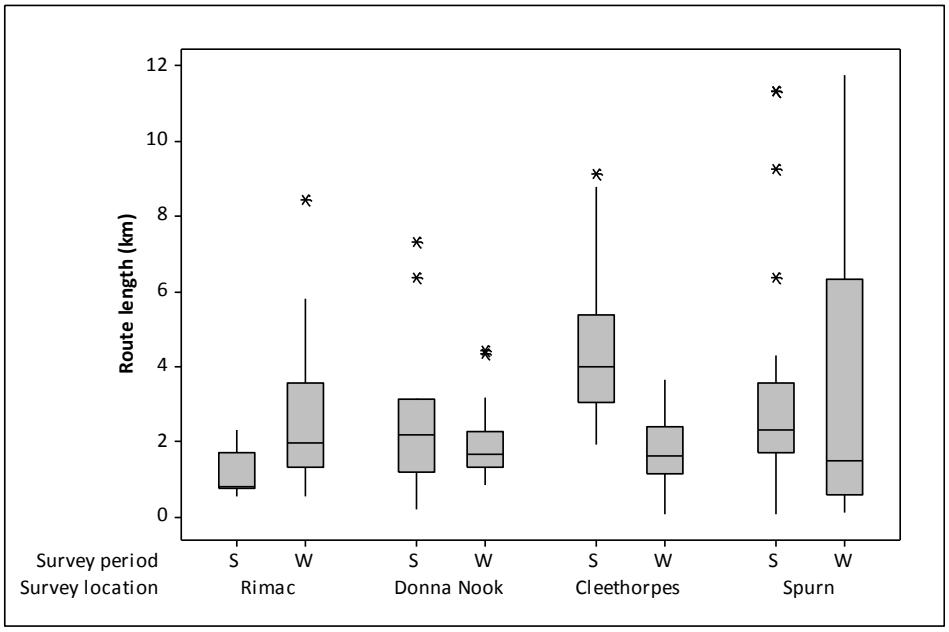

Figure 15: Route length (km) of visitors per survey location covered in both summer (S) and winter (W).

2.67 There was also a significant difference between routes lengths recorded from locations surveyed in the winter (Kruskal-Wallis H=50.13, 20 df, p<0.001) (Figure 16 and Table 25). On average, visitors to Alkborough Flats and Killingholme covered the greatest distance. Visitors to Grain beach (location 17) and Lower Upnor (location 13) covered the shortest distance.

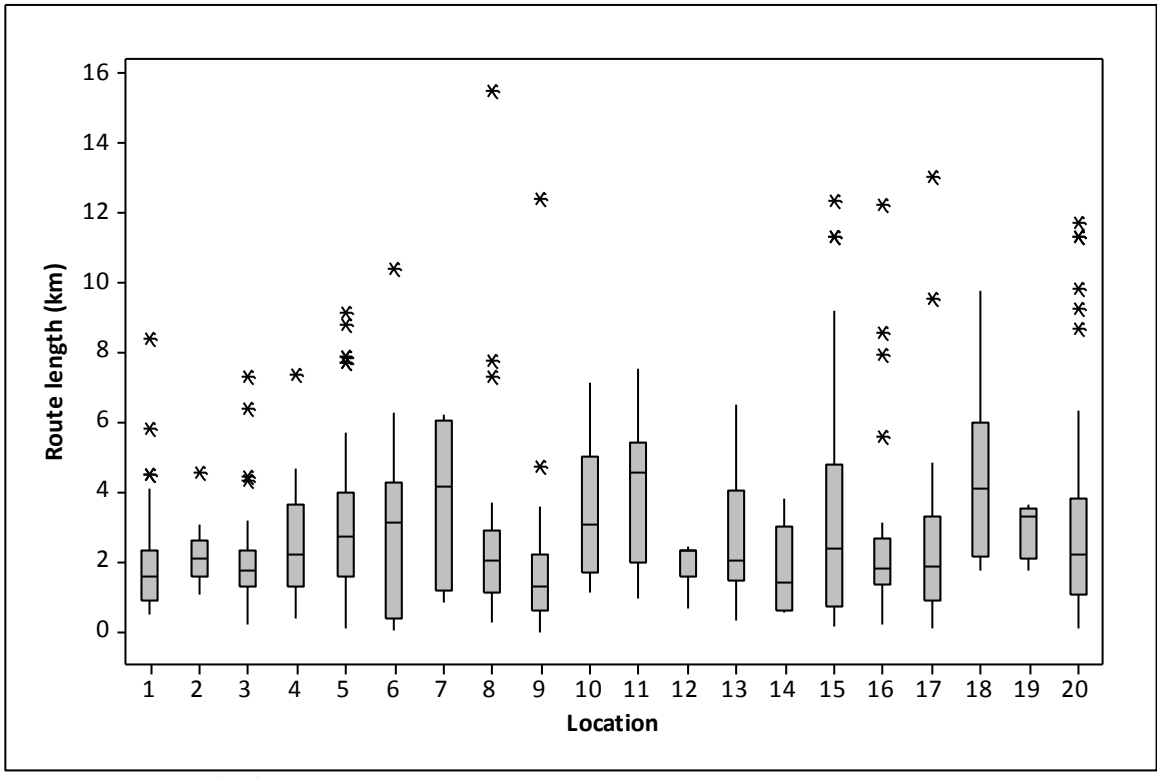

Figure 16: Route length (km) of visitors per survey location. The plot is truncated at 16km.

Table 25: Visitor route length (km) per survey location where N= number of interviewed visitors.

Survey location	25%	Median	75%	Minimum	Maximum	N
Summer						
1	0.75	0.82	1.71	0.52	2.32	15
3	1.19	2.16	3.11	0.21	7.31	22
5	3.07	3.98	5.38	1.93	9.14	37
20	1.71	2.3	3.55	0.08	11.34	23
Winter						
1	1.31	1.98	3.57	0.53	8.43	27
2	1.6	2.12	2.6	1.06	4.59	26
3	1.3	1.66	2.28	0.84	4.43	38
4	1.3	2.22	3.67	0.38	7.4	20
5	1.14	1.61	2.39	0.08	3.64	37
6	0.36	3.16	4.31	0.04	10.44	10
7	1.21	4.2	6.07	0.86	6.25	6
8	1.13	2.06	2.92	0.25	15.51	25
9	0.64	1.33	2.22	0	12.41	41
10	1.71	3.06	5.05	1.12	7.17	10
11	1.98	4.6	5.44	0.94	7.58	13
12	1.57	2.35	2.35	0.69	2.46	25
13	1.46	2.05	4.06	0.34	6.52	33
14	0.73	1.87	3.12	0.55	3.81	10
15	0.75	2.39	4.8	0.13	12.39	31
16	1.35	1.8	2.69	0.24	12.23	44
17	0.93	1.9	3.33	0.09	13.06	41
18	2.16	4.09	6.03	1.74	9.81	10
19	2.14	3.3	3.57	1.75	3.66	4
20	0.6	1.51	6.3	0.11	11.75	13

2.68 Overall, 18.5% of visitors who provided route information stated they walked off the paths and onto the mudflats or open beach. Seventy-seven percent of visitors stated they stayed on the paths and 4.5% were not sure of their route or did not answer the question (Table 26).

2.69 Of the 18.5% of visitors whose route took them onto the mudflats or open beach, 51% had at least one dog with them. Of these, 75% were seen by the surveyor with their dog(s) off the lead.

2.70 The proportion of visitors who went onto the open beach or mudflats was not constant between locations (Table 26).

2.71 A much higher proportion of visitors (40% or more) ventured away from the paths and onto the shore at Rimac, Sea Lane, Saltfleet and Horseshoe Point than at any other of the other locations. In total there were six locations where visitors did not deviate from the path network or go onto the open beach/mudflats (Table 26).

Table 26: The number of interviewees (n) routes which went on the open beach in comparison to those who stayed on a path. Values are compared for each location and expressed as number of visitors (n) and as a percentage of total routes per location (summer and winter surveys combined).

Location code	Route onto open beach/mudflat		Remained on paths no route on open beach/mudflat		Unsure	
	n	%	n	%	n	%
1	17	40	22	52	3	7
2	12	46	14	54		0
3	6	10	51	85	3	5
4	9	45	7	35	4	20
5	20	27	50	68	4	5
6		0	9	90	1	10
7		0	6	100		0
8	2	8	21	84	2	8
9	1	2	38	93	2	5
10		0	9	90	1	10
11		0	17	100		0
12	2	8	22	88	1	4
13	7	21	26	79		0
14		0	9	90	1	10
15	2	6	28	90	1	3
16	9	20	34	77	1	2
17	4	10	37	90		0
18		0	6	100		0
19	1	25	3	75		0
20	12	33	23	64	1	3
Total responses	104	18.5	432	77	25	4.5

Distance straying from interview point

2.72 Total route length gives us information on how far people typically walk, cycle or jog when visiting the estuary. Another useful piece of information is how far people tend to stray from access points and car-parks. We used the route data to determine the distance from the mid-point in each interviewee's route to the survey location. Across all visitor routes the maximum distance was 5137m. The mean (±SE) was 757±32m and median was 545m. This would suggest that half of all interviewees took a route that kept them within 550m of the location where interviewed.

Summary

General visitor patterns

In total 614 visitor groups were interviewed across 20 survey locations (112 in the summer and 502 in the winter) providing data from 1154 individuals and their 395 dogs.

Visitors were not equally distributed across the survey locations. Some locations received a significantly higher number of visitors than others. Results from interviewed visitors showed that:

- 88% of interviewed visitors were local residents.
- 44% of visitor groups were accompanied by at least one dog.
- 51% of interviewed visitors were aged between 41 -65.
- 74% of visitors interviewed in the winter stated they visited the area equally all year.
- 50% of visitors interviewed in the summer spent 1 - 2 hours on a site while 49% of those interviewed in the winter spent less than 1 hour on a site.
- 25% of interviewed visitors made daily visits to the interview location with an additional 24% visiting most days.
- 55% of those interviewed in the winter preferred to visit before midday.
- 29% of visitors stated the main reason they chose to visit the interview location was because it was close to home. The most popular other reason was 'good for dog/dog enjoys it'.

Activities

- The Humber SPA is used for a variety of land, intertidal and water based recreation. Some activities are concentrated around specific parts of the estuary while others are more widespread.
- The most popular main activity cited by 40% of interviewed visitors from both the summer and winter survey sessions was dog walking. Other popular activities cited by visitors were walking, wildlife watching, an outing with children/family, seal watching, kite surfing, bait digging and photography.

Transport

- 70% of interviewed groups travelled to their visit destination by car, while 26% reached their destination by foot. The rest either travelled by bicycle, public transport or other means.
- The proportion of visitors arriving by car/van and by foot varied between the survey locations.

Distance to visit location

- The distance visitors travelled for their trip varied between locations and also varied with activity.
- On average 50% of visitors who arrived at their destination by foot lived within 0.95km of the site. On average 50% of visitors who arrived at their destination by car lived within 8.4km of the site.

Visitor routes

- There was a significant difference in route length between visitors undertaking different activities. Visitors who were jogging or cycling undertook the longest routes. In general the median route length of a summer visit was slightly greater than the median route length recorded during the winter.
- Route length also varied with location, with visitors to Alkborough and Killingholme covering the greatest distance.
- Of those visitors who provided route information 19% stated their route involved them walking off the path and onto the mudflat or open beach. Of these visitors, 51% were accompanied by at least one dog.

Access management – visitor responses

- The most popular features that could be used to encourage visitors to spend longer at their visit locations were better path surfacing and the creation of marked trails. Generally visitors would be discouraged from an area if their dog had to be on a lead, car parking charges were introduced or the site became busier.
- Overall, the majority of visitors indicated that 'nothing' could be done to attract them to an alternative site to the one where they were interviewed. There was some evidence to suggest that dog walkers could be encouraged to use other sites if they were made more dog-friendly.

3. Vantage point counts

Introduction

3.1 As part of the driving transects (see section 5), counts of activity on the SPA were recorded from selected vantage points. The counts provide a 'snapshot' of use at given vantage points. The aim is to count the number of different activities within a pre-defined area (visible from the vantage point) and map where activities are taking place. Therefore each visit to each vantage point count generated a map and an accompanying form detailing all visible activities.

Methods

3.2 The vantage point people counts were undertaken during the driving transects in which also counted the number of vehicles present in each car park adjacent to the estuary (see chapter 4). Ten driving transects were completed and these were spatially randomised to include counts on weekdays/weekends, mornings, afternoons and evenings (see chapter 4). Fifty two vantage points across the estuary were identified (Map 3.1) and most of these corresponded with a layby or car park (Map 3.2). Each vantage point in good weather conditions provided a good and extensive view of the river.

3.3 Surveyors were asked to treat the vantage point counts as snapshots of recreational activity and to mark on an aerial photograph the location of any people, their activity and the number in each group. All people and dogs visible from the vantage point were recorded including those on land, the intertidal and on the water. Commercial shipping activity was excluded from the counts. All activities were categorised using the codes in Table 27. Surveyors were asked to describe any other activities which were observed and did not fit into the pre-defined categories.

Table 27: Codes for recording activities

Description	Code
Dog walker	DW
Dog off lead	dx
Dog on lead	dl
Bait digger	BD
Cycling	C
Jogger	J
Fishing (from shore)	F
Walking / rambling (without dog)	W
Kids playing (with or without parents)	KP
Picnic	P
Birdwatcher	BR
Horse Riding	HR
Metal Detecting	MD
Wildfowling	WF
Swimming	SW
Windsurfer on water	WS
KiteSurfer on water	KS
Canoe on water	Ca
Personal water craft on water	JS

Description	Code
Water skiing	WSk
Rib or similar fast small boat	SMb
Small sailing boat (e.g. Laser / dinghy)	SS
Moderate – large sailing boat, not running motor	LS
Large boat on outboard motor	LMb
Person working on boat (boat stationary)	B
Person accessing boat or water (inc e.g. windsurfers walking across mudflat)	BW
Motor vehicle	MV
Rowing boat	RB
Air-borne (microlights, helicopters, planes etc)	AB

Results

General

3.4 Ten sets of counts were undertaken for each of the 52 vantage points. The vantage point counts were made during the driving transects. There were some teething problems in corresponding the mapped vantage points to those on the ground, hence the omissions of some counts on the early transects.

3.5 A total of 3951 people in 1724 groups were recorded and mapped at vantage points across the whole estuary, 914 dogs were also noted. Of these 75% were recorded off the lead and 25% were on the lead.

3.6 There was a large amount of variation between the number of people recorded at each vantage point which could be attributed to characteristics of the area (such as car parking provision, path quality, good river views), time the count was undertaken (weekday/weekend, early morning vs lunchtime) or environmental variables (rain or sunshine) at the time of the count. Hence we simply present the count data collected from the surveys and focus on the distribution of visitors across the estuary and their activities.

Per vantage point

3.7 The highest numbers of people were recorded from vantage point 20 (promenade at Cleethorpes) and 12 (coast just north of Donna Nook) (Figure 17). Conversely, no people were noted at location 110 (south bank of the river opposite Read's island) and only three people were observed from location 120 (Figure 17 and Map 3.3).

3.8 The number of dogs (on or off lead) recorded at the locations also varied. Very low numbers of dogs were recorded at Spurn. No dogs were recorded at locations 301, 310, 320 and only one dog on a lead at location 325. Locations 115, 70 & 107 recorded at least one dog with each visitor suggesting these sites are popular with dog walkers (Figure 17 and Map 3.3).

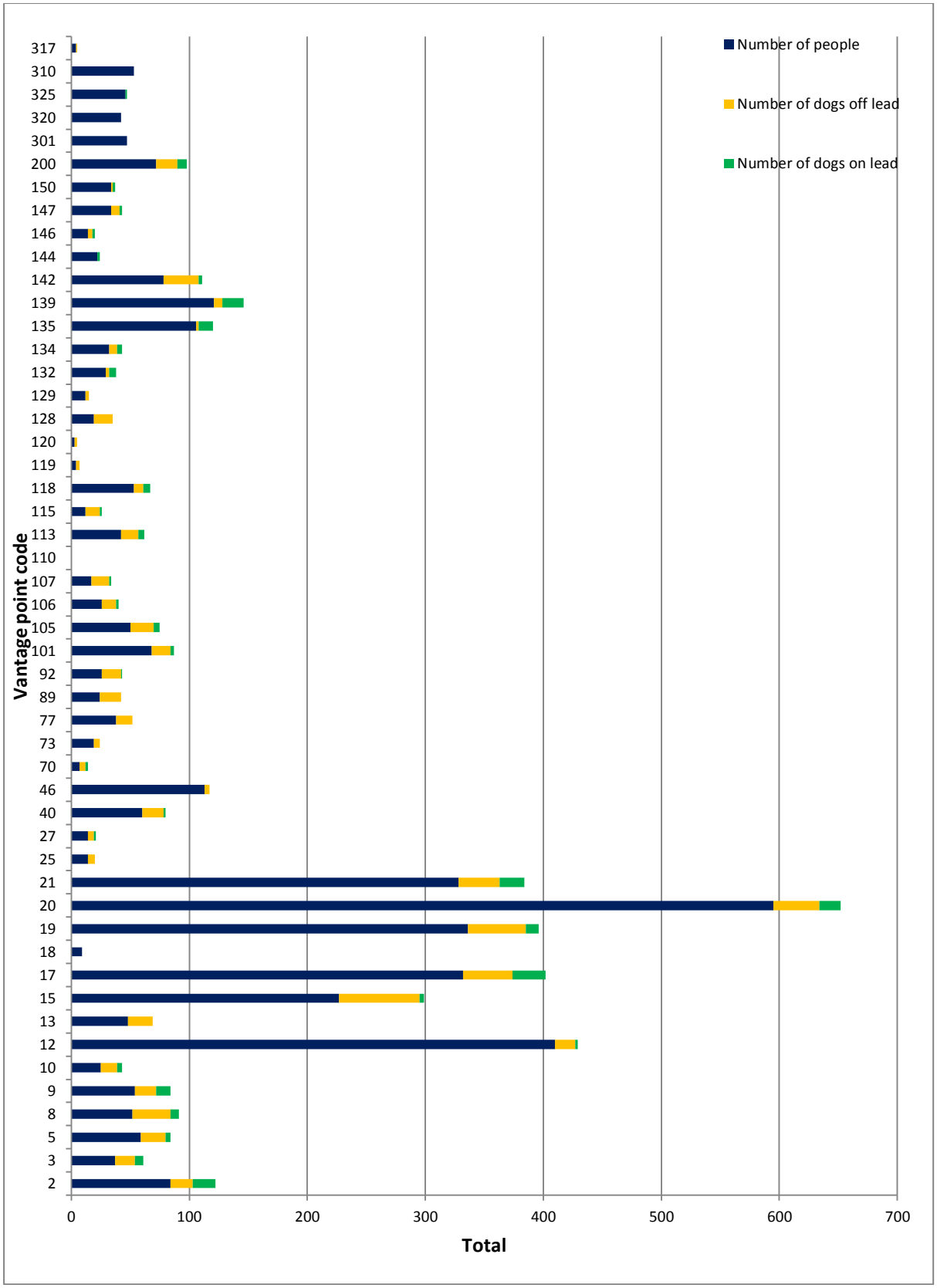

Figure 17: Total number of people and dogs noted at each vantage point

Activities across the estuary

3.9 People were recorded undertaking 17 different activities during the count. A total of 46% (1814 individuals) of all recorded people were walking without a dog and 25% (991 individuals) were dog walking. Together dog walkers and walkers accounted for the activities of 71% of the total number of people recorded (Table 28). Other frequently noted activities were fishing, cycling, bird watching, bait digging, enjoying a picnic and kids playing.

Table 28: Comparison of the total number of people and dogs recorded over all 10 counts per vantage location

Activity (formula)	Number (%) of visitors per activity
Walking / rambling (without dog)	1814 (46)
Dog walker	991 (25)
Picnic	278 (7)
Kids playing (with or without parents)	191 (5)
Fishing (from embankment)	149 (4)
Cycling	137 (3)
Birdwatcher	131 (3)
Fishing (from intertidal)	75 (2)
Bait digger	54 (1)
Horse Riding	50 (1)
Person working on boat (boat stationary)	22 (1)
Jogger	17 (0)
Kite surfer on water	14 (0)
Shooting	8 (0)
Metal Detecting	6 (0)
Motor vehicle	4 (0)
Large boat on outboard motor	2 (0)
Rib or similar fast small boat	2 (0)
Wildfowling	2 (0)
Windsurfer on water	2 (0)
Person accessing boat or water (inc e.g. windsurfers walking across mudflat)	1 (0)
Rowing boat	1 (0)
Total	3951 (100)

3.10 The vantage point counts show that recreation is not evenly distributed across the whole estuary in terms of both visitor numbers and the geography of activities. Map 3.4 shows the differences in people counts across the locations and also reveals how specific activities such as fishing and bait digging are focused around specific stretches of the shore.

3.11 Walking was the most widespread activity across the estuary. The busiest places were Spurn, Cleethorpes and the north and south shores around the Humber Bridge (Map 3.5). Dog walking was also widespread and more frequently recorded on the south bank between Immingham and Grimsby than walking (Map 3.6).

3.12 The majority of fishing observations were centred around a few areas including East Halton, Paull, Spurn and the stretch of coast between Grimsby and Immingham. Only two records of people fishing were recorded north of the Humber Bridge (Map 3.7). Bait digging was only recorded near to the mouth of the river at Spurn, Cleethorpes, Humberston and Threddlethorpe St. Helen (Map 3.8).

3.13 Kite surfing was only observed around Cleethropes at two different locations, Horse Shoe Point and Humberston. The two windsurfing observations were also from Humberston.

3.14 Coastal horse riding was only noted on the south bank near the mouth of the river between Cleethorpes and Threddlethorpe. The majority of records were concentrated around the shoreline of Cleethorpes (Map 3.9).

3.15 More observations of people bird watching were recorded on the south bank of the river across the length of the shoreline. On the north bank bird watching was concentrated around Sunk Island, Paul and Spurn tip (Map 3.10)

3.16 Picnics along the river bank were also very popular with these concentrated around Cleethorpes and either end of the Humber Bridge (Map 3.11).

Comparison of visitor counts across the estuary

3.17 We considered how the people counts differed between locations over the whole estuary by calculating the number of visitors observed within a 200m square during the vantage point surveys (see methods). Maps 3.12 – 3.17. All of these maps are directly comparable and show Cleethorpes, Donna Nook, Hessle and the tip of Spurn as the areas with the most people. Due to the size of the study area it was not possible to present these data on a single map.

Summary

General methods

- 52 vantage points locations were identified and the level of recreational use visible from each was mapped and categorised. Counts of recreational activity were repeated 10 times for each vantage point.
- The vantage point counts were undertaken during the driving transects.

General results

- 3951 people in 1724 groups were recorded across the whole estuary during the counts.
- 914 dogs were noted and of these 75% were off the lead.
- The distribution of people across the estuary was not even.
- The highest number of people were mapped in and around the shore near Cleethorpes .
- More people were noted on the south bank of the river in comparison to the north from the counts.
- People were observed undertaking 17 different recreational activities during the counts. The most frequently observed activity was walking/rambling without a dog (46% of the people mapped/1814 individuals).

Distribution of activities

- The vantage point counts have shed some light on the geographic distribution of activities across the whole estuary. Some activities have a very localised.
- Walking is the most widespread activity and was noted across the whole estuary.
- Generally speaking fishing took place south of the Humber Bridge.
- Bait digging took place only near the mouth of the river.
- Horse riding was only observed on the south bank of the estuary.

Comparison of people counts

- A large grid was placed over the whole estuary with each cell measuring 200m by 200m. We then summed the number of people in each cell (from the mapped data). This enabled us to make a comparison between activity patterns and people numbers across all the locations.
- The grid analysis revealed that Cleeethorpes, Donna Nook, Hessle and the tip of Spurn as the areas with the highest concentrations of people per grid cell.

4. Driving transects - Car park counts

Introduction

4.1 The driving transects aimed to map and quantify the available car parking spaces adjacent to the estuary. Additional car parking areas which were known to be used by recreational users of the estuary were also included. Counts of parked vehicles are useful to provide a study wide assessment of visitor numbers for those visitors arriving by car (70% of all visitors (Table 18)) and the distribution of visitors across the estuary.

Methods

4.2 Car parks, pull in's and laybys in close proximity to the estuary were mapped as were car parks further away from the estuary which recreational users were known to use. In total 189 car parking areas were identified. Driving transects were then undertaken whereby all car parks were visited and the number and type of vehicle present in each was noted as well as the number of available parking spaces.

4.3 To break the driving transects into manageable portions routing software was used to work out how much of the shoreline could be sensibly covered in a single man day. Map 4.1 shows the car parks and the 'man day' sections. A transect was deemed complete when each section had been surveyed. The driving transects were undertaken over several days because of the size of the estuary, where possible survey effort was co-ordinated to cover multiple sections on the same day. Six transects were undertaken on weekdays and four on weekend days.

4.4 Surveyors also undertook vantage point counts at a selection of locations during the driving transects (see chapter 3). In total ten transects were completed, spread over 29 days between 15th August 2011 and 21st February 2012.

4.5 Following the first couple of driving transects slight amendments were made to how the car parks were recorded. During the first transect the car parks on Spurn peninsula were not accurately mapped and there was some confusion as to which laybys to count and which to exclude. For the remaining transects every layby and pull in on Spurn was mapped and monitored on each transect. Car park 11 also contains some inconsistent results as it was a temporary car park to accommodate additional vehicles for visitors viewing the seals at Donna Nook. We also revised how some of the larger car parks were counted and broke these into areas to aid with surveyor recording consistency.

Results

4.6 The 189 mapped car parking areas contained 3691 spaces of which 3305 were formal spaces (car parks, hard standing or clear dedicated parking areas) and 386 informal spaces (comprising of pull in's and laybys). Overall 66% of the car parking spaces around the estuary are located on the south bank and 33% on the north (Table 29 and Map 4.2). Not only is there a higher number of spaces on the south bank there is also a higher number of formal and informal parking places.

4.7 Despite a higher number of car parking places and spaces on the south bank, a higher number parked vehicles were actually recorded in the car parks on the north bank of the river (5129 for the south in comparison to 5371) over all ten transects (Table 30).

4.8 A total of 10,500 cars, 43 vehicles with bike racks and 98 campervans were recorded in the car parks adjacent to the estuary (Table 30). We estimate this equates to a total number 21,123 visitors (Table 31). The number of parked cars recorded on each transect differed. The lowest number of cars recorded was 441 on a weekday transect in late January with the highest number of 1747 recorded on a week day transect in mid-January (Table 30).

4.9 Map 4.3 shows the average numbers of parked cars recorded in each car park across all the driving transects. As would be expected the larger car parks had the greatest average number of cars with clear concentrations of vehicles in and around Cleethorpes, Kingston upon Hull and both at the North and South end of the Humber bridge. The car parks/laybys at Spurn were well used as was the informal series of lay bys and pull ins between East Halton Skitter and Grimsby. The cluster of large coastal car parks between Donna Nook and Theddlethorpe (Map 4.2) all had relatively low levels of use (Map 4.3).

4.10 To highlight the car parks which were frequently used we took the average number of parked cars recorded in each car park and converted this to a percentage based on the car parking capacity of each car park. This provided an average indication of car park 'fullness'. Map 4.4 presents this information as a graduated map of the whole area, whereby the larger the circle the fuller the car park. These data are also presented on Maps 4.5 to 4.8. The fullest car parks were the parking bays at Tetney Lock (14), the Buck Beck car park (17), the layby near Pyewipe (23), the coastal layby by the power station near Stallingborough (45) and 'The Deep' attraction car park (141) (Maps 4.5 – 4.8).

4.11 In October, December, January and February (the months where both weekday and weekend transects were completed) 3076 cars were counted on weekdays and 4937 on weekends. However, there was no significant difference between the numbers of cars recorded on weekday and weekend transects (Wilcoxon signed ranks test where $W = 1.0$, $p = 0.2$ and $n = 4$). In total there were only 11 car parks which consistently contained a higher number of parked vehicles on weekend counts (Map 4.9). Of these 11 locations, nine of these are classified as dedicated formal parking areas to specific locations (Alkborough, Donna Nook, Rimac viewpoint, Buck Beck, Viewpoint at Paull). At these locations there was a significant difference between the median number of parked in these car parks on weekdays in comparison to weekends (Mann-Whitney Test, $W = 1417.5$, $n = 44$ and $p < 0.001$) demonstrating the popularity of these sites with weekend visitors.

Table 29: Car parking provision around the Humber estuary

Type of parking	North Bank		South Bank		Total	
	Spaces	Car parking areas	Spaces	Car parking areas	Spaces	Car parking areas
Informal parking	172	30	214	73	386	103
Total formal parking	1091	31	2214	55	3305	86
Totals	**1263**	**61**	**2428**	**128**	**3691**	**189**

Table 30: Summary of the driving transects around the estuary.

Transect number	Day of week	Number parked cars	South bank cars	North bank cars	Number cars with bike racks	Number campervans	Dates of transect (sections could be undertaken on different days)					
1	Weekday	1470	997	473	4	5	15/08/2011	16/08/2011	17/08/2011	18/08/2011	22/08/2011	24/08/2011
2	Weekday	1005	723	282	2	10	03/10/2011	04/10/2011	05/10/2011			
3	Weekend	1369	981	388	19	41	29/10/2011	30/10/2011				
4	Weekday	1017	352	665	1	7	14/11/2011	15/11/2011	16/11/2011	17/11/2011		
5	Weekend	681	449	232	2	5	03/12/2011	04/12/2011				
6	Weekday	1004	226	778	4	8	27/12/2011	28/12/2011	29/12/2011			
7	Weekend	1747	649	1098	1	12	14/01/2012	15/01/2012				
8	Weekday	443	173	270	4	0	30/01/2012	31/01/2012	01/02/2012			
9	Weekend	1140	258	882	3	7	18/02/2012					
10	Weekday	624	321	303	3	3	20/02/2012					
	Total	**10,500**	**5129**	**5371**	**43**	**98**						

Table 31: Numbers of cars per transect and estimated number of visitors

Transect number	Cars			Estimated number of visitors = Cars * 2.0 (based on average number of visitors per vehicle from the on-site visitor survey work, refer to paragraph 2.47)		
	North	South	Total	North	South	**Total**
1	473	997	**1,470**	952	2,006	**2,957**
2	282	723	**1,005**	567	1,454	**2,022**
3	388	981	**1,369**	781	1,973	**2,754**
4	665	352	**1,017**	1,338	708	**2,046**
5	232	449	**681**	467	903	**1,370**
6	778	226	**1,004**	1,565	455	**2,020**
7	1098	649	**1,747**	2,209	1,306	**3,514**
8	270	173	**443**	543	348	**891**
9	882	258	**1,140**	1,774	519	**2,293**
10	303	321	**624**	610	646	**1,255**
Totals	**5371**	**5129**	**10,500**	**10,805**	**10,318**	**21,123**

Summary

General methods

- 189 formal and informal parking areas adjacent to the estuary were mapped and the number of car parking spaces in each was recorded.
- 10 estuary wide driving transects were undertaken to record the number of parked vehicles in each of the car parks.
- Six transects were undertaken on weekdays and four on weekend days.
- The vantage point counts were undertaken during the driving transect at selected locations.

General results

- In total we estimate there to be 3691 car parking spaces across the estuary. These are comprised of 3305 formal parking spaces (in car parks, hard standing etc) and 386 informal parking areas (laybys/pull ins).
- Of the 3691 parking spaces around the estuary 67% (2428) of these are located on the south bank and 33% (1263) on the north.
- 10,500 parked cars, 43 bike racks and 98 campervans were recorded. The highest number of vehicles recorded on any one transect was 1747 and the lowest 443.
- With an average number of 2.01 visitor per car (from the onsite visitor survey work). We estimate that 10,500 parked cars equate to 21,123 visitors to the Humber SPA.
- There were more parked cars recorded on the north bank than the south over the driving transects.
- There appeared to be no significant difference in the total number of vehicles that were recorded per transects on weekday and weekend driving transects. However there were 11 car parks which contained a statistically significant higher number of parked vehicles at weekends suggesting these areas have a higher level of recreational use at weekends.
- The parking areas which on average were the fullest were the parking bays at Tetney Lock (14), the Buck Beck car park (17), Layby near Pyewipe (23), coastal layby by the power station near Stallingborough (45) and 'The Deep' attraction car park.

5. Other supplementary Information

Overview

5.1 Additional information on recreational activities was gathered from interviews, informal discussions and on-line questionnaires. We purposefully targeted groups associated with particular activities that were likely to be under represented in the face to face visitor work. In this section we summarise the output of the interviews to provide an overview of each activity and detail factors which are known influence where the activity takes place and when. Over the course of this study we have collated route information from different estuary using GPS units, the maps of which can be found in the accompanying map annex.

Methods

Interviews

5.2 A series of face to face interviews were undertaken. The interviews targeted individuals who participated in activities in and around the estuary that we felt were likely to be under represented in the visitor survey data as they took place on the water, in the air or during darkness, and thus unlikely to be interviewed during the on-site survey work.

5.3 The aims of the interviews were to better understand where and when these activities take place and also any conditions and factors which may influence activity levels. Interviews were undertaken with those from the angling, aviation, kitesurfing, sailing, wildfowling and wildlife/birdwatching communities. Each interview was semi-structured with the aim of finding out how long interviewees had been undertaking the activity, membership to any groups, when they take part in their activity, how often, how long they spend doing their activity, their favoured places and reasons for visiting particular locations, the transport used, routes taken at the site, conflicts with other users and opinions on how activity levels have changed over time. The interview write ups are summaries of the interviewee's responses to prompted questions and hence reflect their personal opinions and anecdotal observations.

On-line questionnaires

5.4 We designed two on-line questionnaires targeted at anglers and those who sail. There are several angling and sailing clubs across the estuary with active on-line communities. We hoped that by posting the surveys on forums and through clubs we could gather further information on each activity.

5.5 The on-line surveys were created using SurveyMonkey and comprised of a range of multiple choice questions with the option for free text responses. The angling questionnaire was posted on the Holderness fishing forum and open for responses between 15th December 2011 and 10th February 2012. The sailing survey ran between 20th December 2011 and 8th February 2012 and was posted on Hull Sailing club website and sent to members. Members on the email distribution list of Humber Yawl Club were also sent the survey.

Route information

5.6 Route information was gathered either through the distribution of GPS units to user groups or the submission of individual routes already recorded using personal GPS equipment. Route data were collected from wildfowlers, ramblers, kite surfers and sailors.

Results

Angling- Interviews

5.7 Angling takes place across the Humber throughout the year. Between April and September anglers will generally be fishing for flounders (flat fish) and bass and between October and April anglers will be looking to catch cod.

5.8 Anglers will generally time their visit dependent on the weather and the tide, as it is only possible to fish from the shoreline in some areas at high tide. To some respect the tide governs access. There are significant distinctions between fishing on the north and south bank of the river. The majority of angling happens to the East of the Humber Bridge, with no angling between Paull and Sunk Island. Night fishing at Spurn used to be very popular with anglers targeting cod.

5.9 Visit duration is also dependent on the weather and the tide as is visit frequency. Where anglers stand when they fish could either be on the embankment or at the water's edge – it depends on the location and the tide. Most trips to the estuary are made by car and anglers often car share if they are heading out in a group. Car parking to a degree plays a role in selecting where to fish and anglers avoid parking in areas where there are charges.

5.10 Angling for many also involves digging bait which comprises of digging or using a suction pump on intertidal areas where air holes are seen for ragworm and lugworm. Bait is dug using a fork and bucket or a suction pump and generally takes place over a falling or low tide in calm condition. When the weather conditions are cold, the anglers need to dig deeper to get the bait. There is usually a large (approximately 50%) decline in bait abundance in October when the worms are spawning. Bait is often dug on the same day as fishing, but can be saved and used on another day.

5.11 The majority of bait digging takes place around Spurn where the substrate isn't too sticky. There appears to be localised disappearance of ragworm where the quality of the sewage outflow into the river has improved.

5.12 There has been a decline in the number of anglers on the river namely because many anglers feel dishearten by the lack of catches, especially cod. There is confidence that should the numbers of fish increase, so would the numbers of anglers on the river.

5.13 Illegal netting has been noted off the sand bank of Kilnsea Clays and Trinity tower.

5.14 In recent years, with the mild conditions, dog fish and smoothhound have been present.

Angling – On-line questionnaire responses

5.15 In total 37 individual responses were submitted from those in the angling community.

5.16 In general most anglers visit the river two to three times a month and visits tend to last either around half a day or a day. Between August and March a quarter of the respondents visit at night. The majority of respondents fish from the shoreline (as opposed to the sea wall) and all use a rod and line. Most respondents shift where they fish seasonally and tend to fish the river between October and January. Respondents indicated the North Eastern (Paull – Spurn) area is the most popular place to fish (Map 5.1). Half of the respondents dig their own bait with the majority of respondents digging at Spurn (Map 5.2). All respondents travel to the river by car and most have been fishing in the area over 20 years and are not associated with any angling clubs. The full results of the survey are presented in Appendix 2.

5.17 The postcodes of the anglers who responded to the on-line questionnaire are presented in Map 5.3. Several of the postcodes are adjacent to the north bank and clustered around Hull but there are also some near the river on the south bank. Anglers also travel some distance to fish on the Humber residents from Leeds, Doncaster and Bridlington.

Angling – Other local comments

5.18 Bait digging along the south bank occurs between Salftfleet and Mablethorpe and can be intense at times and access is through Rimac, Churchill, Brickyard and SeaLanes at the Saltfleetby-Theddlethorpe NNR. Bait (lugworms) dug in these areas can be seen for sale along the coast road and are used by weekend leisure fishers at Skegness and Saltfleet.

5.19 The best time to dig bait is an hour either side of the low tide spring flood tides, which occur approximately every two weeks. The methods of bait digging have shifted in recent years and although bait is still dug with a fork and bucket many collectors now harvest bait using suction pumps which are more efficient and not as energy intense as a fork and bucket.

Sailing– Interview

5.20 Boating takes place across the Humber throughout the year. The seasonal weather conditions greatly influence when people will take to the water and generally between Easter and October are the times when there is most activity.

5.21 The tide and the location of a boat will be the deciding factor in when a boat can be taken out. There are several boating clubs situated around the river and the strength of the tidal influence will differ for each. At Brough there are no tidal constraints and the majority of smaller racing boats are launched in the shallow water. There is a strong tidal influence at Humber Yawl Club such that launching and returning boats to the club are limited to a 2 hour window either side of high tide.

5.22 The length of a boat trip is therefore dependent of several factors, the weather, the tidal conditions and the location of the boat. Perhaps the best predictor of trip length is the origin of the people, those who live further away will spend a weekend on a boat whereas club members are more likely to head out for a half day/ days sailing.

5.23 There is a diverse range of boating activity across the Humber with motor yachts, dingy racing, sail yachts and motorboats. Over recent years there has been an increase in the number of motorised craft, personal water craft, speed boats and power boats. For boat owners who don't have moorings or keep their vessel at a club there are three public slipways where the boat can be launched –Cleethorpes, Hessle and Grimsby. The increased use of the upper areas of the river by personal water craft can be linked to the launching access from the public slipway at Hessle.

On-line questionnaire responses – Sailing

5.24 In total 50 submitted responses were received from those in the sailing community who owned sail and motorboats and sail and motor yachts and as such well represent the diversity of the boating community. The majority of people take their boats out between 2 and 3 times a month (between August and March) and at weekends. Tide and wind were the most influential factors in deciding when to take a boat out.

5.25 The most popular months to sail are over the Summer/early Autumn between May and September and most activity takes place off the north bank of the river and out to sea (Map 5.4).

5.26 Three quarters of the respondents are associated with a sailing/boating club and have members from a wide geographic area including West Yorkshire, North Yorkshire, Lincolnshire, Nottinghamshire and East Riding (Map 5.5).

5.27 Map 5.6 shows the variety in routes taken by a sail boat from a single yacht club, the direction of travel will be governed by the wind.

Kitesurfing – Interviews

5.28 Kitesurfing primarily takes place off the coast of Thorpe holiday park, just south of Cleethorpes. The main pulse of activity is between April and September but the dedicated will often take to the water until the end of December. Insurance is needed and is available through the British Kitesurfing Association.

5.29 Kitesurfing is totally based on wind strength and direction. Optimal conditions for Cleethorpes are above 8^{o}C with a non gusty onshore or cross offshore wind between 15mph and 25mph. No kitesurfing takes place in an offshore wind around Cleethorpes (safety) and there is also no activity around the RAF area at Donna Nook.

5.30 There is no set route or circuit that is undertaken and the direction of movement will be governed by the ability of the kite surfer, the wind and the river dynamics at the time. Map 5.7 shows some actual routes. Generally experienced kit surfers will go up to a mile offshore, up to the forts and back. This needs consideration of conditions so as to avoid wading back through the soft mud. If conditions are good people will kite surf all day.

5.31 Occasionally the odd kite surfer will get caught out with the wind on their bearings and pass through some fishing lines. Historically there has been some tension between kite surfers and those boating. There has never been any problems between kite surfers and those on personal water craft as they are undertaken in different conditions.

5.32 The heavy equipment and need to change from wet to dry kit means that all kite surfers will travel by car to the launch location. Cleethorpes is a popular kitesurfing destination because of the sandy beach with regular visitors from Newcastle, Leeds, Lincoln, Manchester and Blackpool.

5.33 Interest in kitesurfing has increased substantially over the past decade and continues to so. Twelve years ago there was a single kite surfer on the water in optimal conditions and currently it is not unusual to observe 40 kite surfers in optimal conditions on a weekend day. As such a kite surfing group 'Cleethorpes Kitesurfing Group' was formed as a point of contact for the council. The group is not active as such but was set up as a focal point for communications.

Wildfowling - Interviews

5.34 The wildfowling season is between 1st September until 20th February (no shooting on Christmas day). Wildfowling generally takes place early in the morning, half an hour before dawn for a couple of hours or nearer the end of the day about an hour before dusk. Night time shoots can take place but only on a full moon (for the light) and with light cloud cover. Wildfowlers can only shoot beyond the high water mark onto and over the river. Game can only be shot over the water. Visits typically last between two and three hours, examples of actual routes taken by wildfowlers are shown in Map 5.8.

5.35 Wildfowling activity is regulated and requires consents and licences which are exclusive to specific areas. These areas are either leased or owned by the wildfowling groups. As part of the consent and licence conditions individuals must submit data relating to their foreshore time at the end of the season. Activity on the north bank is focussed around Faxfleet, Crabley Farm to Brough Haven, along the shore between Stone Creek and Easington, Patrington Haven, Welwick and Old Hall. On the south bank location depends on bird activity.

5.36 Most wildfowling visits last between two and three hours and wildfowlers are usually on the interface between the green shore and the mud. Wildfowlers need to remain concealed and camouflaged and may choose to take portable hides if there is limited vegetation cover. The birds may be encouraged to move by calling (using a whistle) or by using decoys (weighted plastic birds which encourage real birds to settle on the water). Decoys are only now used on the north shore.

5.37 Different types of ammunition are used to shoot different bird species and the shots themselves are expensive (between £1 and £4) and so wildfowlers choose carefully when and which animal to shoot. The wildfowling association also introduces wildfowling bans in harsh winters if there is a notable decline in the condition of the birds.

5.38 All game shot is for the table. Opportunities for wildfowling depend on the birds which are present and which areas they are using. The most prized game is geese and duck in particular pink foot geese. Other targeted species include Canada and grey lagged geese, mallard, wigeon, teal, pintail, shovler and gadwall.

5.39 Wildfowlers always travel by car and parking and access to the foreshore can be an issue. Access and parking permissions have often been negotiated directly with landowners where no public access/parking exists. Each vehicle used by wildfowlers has to be identifiable, so other wildfowlers know who is there. Only a limited number of guns are permitted to be in an area at any one time and some locations have gates/padlock systems that only allow a limited number of people through. Wildfowlers will always be accompanied by a gun dog to retrieve the shot game.

5.40 There has been occasional conflict between wildfowlers, anglers, bait diggers and bird watchers where those not wildfowling had been parking and using the access routes on private land especially negotiated between the wildfowling organisations and the landowners. In places this raises some tension with the local residents and takes the parking opportunities away from the wildfowlers.

5.41 The interviewees felt that wildfowling activity levels have been relatively stable as the sport is heavily regulated[4] and that recruitment from the younger generations was currently low. Wildfowlers have noted a particular increase in 'birders' and a notable increase in angling and angling matches on the north bank.

5.42 Other activities which have increased in recent times that wildfowlers think may have the potential to impact the birds include, the wash from commercial shipping, habitat loss, bird scarers, commercial or land owner organised shoots (on baited land adjacent to the SPA).

Aviation - Interviews

5.43 For the purposes of this report we use the term aviation to refer to craft classified as group 'A' (single piston engine), microlights, autogyro's and paramotors only.

5.44 Recreational aviation occurs all year with activity peaks in June. July and August. Most aviators will take out their craft on a weekend day. Weather conditions and daylight strongly govern activity levels. An average craft will hold enough fuel for a 2.5 to 3 hour flight. Aviators are requested not to fly below 500ft if there is a vehicle, vessel, structure or person present. This does not apply to roosting birds or livestock.

5.45 Flights fall into two categories, transit (where you travel and land elsewhere) or a 'bumble' where you take off and land from the same airfield. Each of these flights will be constrained by the volume of fuel a craft can hold, but on average a bumble will be a maximum of 2.5 hours. A craft can refuel on a transit flight. It would take about 30 minutes for a larger craft to reach Norfolk.

5.46 Aviators pay particular attention to the weather forecast especially the wind direction and strength, visibility and cloud base to ensure suitable conditions for take-off and landing. If it is windy and turbulent then it is unlikely craft would be taken out for the day.

[4] Regulation takes place through the consents issued to clubs by Natural England.

5.47 In terms of routes, aviators will generally fly down the coast, often to Cleethorpes pier then onto Mablethrope and back because the scenery is attractive. Aviators would avoid flying along the river, over congested areas (built up areas on an aviation map) and over Humberside air space. Routes flying out to sea are avoided as in the event of engine failure it would be difficult to find somewhere to land! Other favoured destinations among aviators are Wieknby, Sturgate and Shelburn. There is a preference for flying over the land wherever possible. Some club members may fly to Donna Nook over a weekend (only time the RAF air space is open) to look at the seals.

5.48 There is very limited potential for conflict between recreational aviation and other recreation activities. Kite surfing does occur at Horseshoe point (adjacent to an airfield) but this doesn't interfere with landing craft and there are no problems with commercial shipping. There is the possibility of a new wind farm at the end of the airfield which would impact the current patterns and level of recreational aviation in this location.

5.49 There is the potential for recreational aviation to conflict with bird populations and behaviour at Alkborough as this is the only air space craft from Santoft and Thorn Humberside airport/fields can practice forced landings.

5.50 Aviators have only recently been made aware of the declining tern colony and bird numbers. At present there are no specific wildlife based codes of conduct. Most aviators have some awareness of environmental issues and are sympathetic about these issues and broader issues such as pollution. There is no regional organisation which flying clubs sign up to and hence other than the standard code of conduct local issues are open to interpretation.

5.51 The issues relating to recreational disturbance and potential bird declines are complicated and currently there is little or no evidence based information (that has been presented to aviators) to directly link aviation activity to bird population declines. The aviators would welcome clear, simple guidance on how they can support any project and why. This clear guidance would be much more constructive if it were evidence based. Given the technical nature of aviation guidance should be supplemented with best practice guidance in a terminology suited to aviators. Ideally more effort should be made to engage with more of the other aviation clubs.

5.52 Another consideration is the level of military activity over the Humber. The military craft fly lower, faster and more frequently than the recreational craft and hence have the potential to cause higher levels of disturbance. Interviewees were keen that, before any restrictions on recreational aviation, issues arising from military activity should have been thought through.

Wildlife and bird guided walks and courses - Interview

5.53 The interviewee was with a local guide, running ten week wildlife and bird watching courses on an afternoon and morning between September and November and January and March. About 20% of the course comprises of visits to the Humber. The visits typically last about 2 hours and there is a maximum of 12 people in any session.

5.54 Precise visit locations depend on the weather and the tide. Estuary visits are timed at high tide so the birds are closer to the shore and easier to see and often the groups get to see the waders under pressure from birds of prey. Visit destinations include the hides at Blacktoft sand, Alkborough. Patrington for wading birds, Paull, Stoney Creek and Donna Nook (for the seals).

5.55 Public access governs where the groups can be taken. With a group of 12 parking needs to be taken into account and group members are encouraged to car share , as at some locations (Alkborough and Patrington Haven) there is limited parking.

5.56 In terms of other types of recreation conflicting with bird and wildlife interest, anglers were cited at one location as having fenced off a private fishing area on a former kingfisher breeding location. Motorbikes were mentioned as a problem at Patrington and Welwick. Sseveral dogs are regularly seen off lead at Patrington (near to the 500 berth caravan site) and at Brough.

5.57 There has been a notable increase in daily bird watching in the hides at Blacktoft and the hot spots are regularly full at the weekends. Patrington Haven shows up a number of rare birds which brings twitchers – the road is frequently full of cars when a rarity turns up. Technological advances combined with social networking websites which report unusual bird sightings and their geographic location have definitely increased the speed of information sharing, exposure and competitive nature of the twitchers.

5.58 Coupled with an increasing interest in birding, interest levels in general wildlife have increased. In the early days as a wildlife guide there was only demand for one morning course a week while current demand is for eight courses a week, this has remained constant over the past three years.

Summary

- Angling takes place across the Humber throughout the year at night and during the day and is concentrated to the east of the Humber Bridge. The majority of anglers fish from the shoreline and some fish from the sea wall on the south bank. Both use a rod and line. Around half of the anglers who responded the on line questionnaire dig their own bait. There has been a decline in the number of anglers in recent years which is presumable linked to the reported decline in fish.

- Boating takes places across the estuary throughout the year although activity peaks between May and September. The weather conditions and where the boat is moored will influence the times and location of each trip on the water.

- Kitesurfing can only be undertaken in very specific weather conditions and the majority of activity occurs at Humberston and at Horseshoe point. The main pulse of activity is between April and September although for the dedicated the season will extend into the cold months. The popularity of the sport has grown substantially over the years and is continuing to do so.

- The wildfowling seasons runs between September and late February. Wildfowling is heavily regulated by licences and consents and only permitted in specific areas. Wildfowling involves a dusk or dawn visit of typically 2.5 hours. Often wildfowlers have specifically negotiated parking and access to the foreshore from private land owners. There are limits on the number of guns that can be present in any one area, at any one time.

- Recreational aviation occurs all year round and activity peaks in June, July and August. There are numerous flying clubs across the estuary but no regional organisation exists to oversee regional or local activity. Aviators will prefer to fly over land rather the sea. Aviators are requested not to fly below 500ft if there is a vehicle,

- vessel, structure or person present. This does not apply to roosting birds or livestock. Aviators have only recently been made aware of the decline in bird numbers across the Humber. Most aviators are environmentally aware and would respond positively to clear messages linked to bird decline and any associated guidance. However, there is a lot of military aviation over the Humber, more so than any recreational flying and this should also be considered when compiling aviation guidance.

- There has been an increase in the number of visitors interested in wildlife and bird watching. There have been several negative comments from interviewees about the nature, manner and numbers of twitchers that can be in a location following the sighting of a rare bird. Comments range from parking and congestion issues to the numbers of birders trying to get close to the bird to get images. Part of the problem is most likely caused by technological advances and social networking sites.

- Other frequently cited concerns were wide ranging and all interviewees mentioned a substantial increase in motor craft, increase in the level of airborne activity (microlight etc) and concerns were also expressed about large scale shoots on private land adjacent to the SPA, there were also indications that the land may even be baited to encourage the presence of birds prior to a shoot.

- The angling and sailing communities were happy to engage with project. We posted an on-line questionnaire on a fishing forum and the sailing survey was emailed to members of various different clubs. Overall we had a far higher response rate than we could have anticipated.

6. Visitor survey results in context with bird data and implications for management

Overview

6.1 In this section we consider the bird interest and identify the important areas for birds within the site. We then consider these areas in relation to access and the results from the previous sections of this report. This allows us to identify areas where there are potential conflicts or cause for concern. Management options and implications for the SPA are considered.

Key areas for birds

6.2 All areas within the SPA boundary will be important for birds and the designated interest features. Some areas outside the boundary may also be intrinsically linked, for example supporting occasional roost sites or feeding areas. In addition some locations within the SPA boundary may be of importance. For example particular roost sites may at times hold a large proportion of the waterfowl assemblage. While all intertidal habitat potentially provides feeding sites for waders and wildfowl, some areas of mudflat will be specifically rich in invertebrate food and be particularly important for certain species.

6.3 Bird data for the Humber is summarised in (2010a), where the maps and summaries of WeBS data provide context to allow us to identify areas particularly important for certain species and key locations. The WeBS sections are listed in Appendix 4. In Appendix 5 we repeat the WeBS data summary for key species (SPA interest features) that is provided in Cruickshanks *et al.* (2010).

6.4 In this report we supplement the WeBs data and highlight 49 key locations for birds within the estuary shown in Map 6.1. The map highlights locations that are important feeding or roost sites for particular species, and therefore might be considered particularly sensitive locations within the estuary. Details of each location, why they are important and when, are summarised in Appendix 6 (Table 36). These areas were drawn based on the experience of one local observer (Graham Catley), who has surveyed birds around the Humber for many years.

Cross-referencing bird and recreation data

6.5 We can relate the visitor data to the bird data by identifying the levels of use and types of activity occurring at the areas important for birds. We do this in Table 32, which lists the different WeBS sectors and cross references to Map 6.1 and the key locations for birds. The table also summarises the vantage point data, highlighting the levels of different activities occurring in and around each area.

Table 32: Bird Data and visitor data. Each row corresponds to a WeBS sector (core counts). Key species listed are those highlighted in Appendix 5, and the map refs allows cross-reference with Map 6.1 for key areas in or adjacent to the WeBS sector. The remaining columns summarise visitor data, drawing from the vantage point data. The number of vantage points (either inside the sector or within a 100m radius) is given and the total number of people counted by activity is summarised (again either within the sector or within 100m of the sector boundary). Note that the number of vantage points within each sector varies. The paler grey shading indicates activities with at least 10% of the total people count, dark grey shading indicates at least 25%.

WEBS Sector	Key Species from Core Count	Map Refs for key locations	No. of vantage points	Person working on boat	Bait digger	Birdwatcher	Cycling	Dog walker	Fishing /angling	Horse Riding	Jogger	Kids playing (with or without parents)	KiteSurfer on water	Picnic	Walking / rambling (without dog)	Wildfowling/shooting	Windsurfer on water	Total People (all activities)
35478 (Grainthorpe to Somercotes)	Oystercatcher, Shelduck	6,7,8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
35479 (Theddlethorpe to Mablethorpe North End)		1	2	0	1	3	0	73	0	8	3	0	0	0	33	0	0	127
35480 (Theddlethorpe to Saltfleetby)	Cormorant, Whimbrel	2,3	1	0	0	4	0	22	0	0	0	0	0	0	26	0	0	53
35481 (Saltfleet)	Dark-bellied Brent Goose	4,5	3	0	0	4	5	83	0	2	0	0	0	0	33	0	0	128
35483 (Donna Nook (Humber))	Cormorant, Shelduck		0															
35484 (Somercotes to Donna Nook)		6,7	1	0	0	6	0	31	0	0	0	0	0	0	378	0	0	415
35485 (Grainthorpe Haven (Humber) Pye`s Hall to Horse Shoe Point)	Dark-bellied Brent Goose, Oystercatcher	8,10	1	0	0	0	0	10	0	0	0	0	8	0	4	0	0	22
35486 (Horseshoe Point to Tetney Haven (Humber))		9,10,11	1	0	1	0	0	11	0	0	0	0	6	0	13	0	0	31
35487 (Tetney Haven to Humberston Fitties (Humber))		11,12	1	0	3	12	7	89	7	0	0	12	1	0	92	0	2	230
38201 (North Killingholme Haven Pits)	Black-tailed Godwit, Redshank	23	1	0	0	2	0	3	0	0	0	0	0	0	0	0	0	5
38401 (Cleethorpes - North Promenade to Anthony`s Bank)	Knot, Sanderling	13,14	4	0	0	4	71	307	11	39	10	158	5	259	702	0	0	1567
38403 (Cleethorpes North Wall to Grimsby)			1	0	1	0	8	30	0	0	0	0	0	0	23	0	0	62

WEBS Sector	Key Species from Core Count	Map Refs for key locations	No. of vantage points	Person working on boat	Bait digger	Birdwatcher	Cycling	Dog walker	Fishing /angling	Horse Riding	Jogger	Kids playing (with or without parents)	KiteSurfer on water	Picnic	Walking / rambling (without dog)	Wildfowling/shooting	Windsurfer on water	Total People (all activities)
38405 (Pyewipe)	Black-tailed Godwit, Shelduck	15,16,17,18	4	0	0	3	17	37	137	0	1	0	0	0	6	0	0	201
38406 (Killingholme Marshes)		19,20,21,22	1	0	0	2	0	5	0	0	0	0	0	0	0	0	0	7
38407 (Halton Marshes)		24	2	0	0	0	0	9	20	0	0	0	0	0	21	0	0	52
38409 (Barton Cliff)	Bittern	30	1	0	0	3	0	16	2	0	0	0	0	0	21	0	0	42
38411 (Goxhill Marsh)	Goldeneye	25,26,27	1	0	0	1	0	16	6	0	0	0	0	0	5	0	0	28
38412 (Goxhill to New Holland)	Goldeneye, Pochard	27,28,29	0															
38413 (New Holland to Barrow)		29	1	3	0	0	2	8	0	0	0	0	0	0	8	0	0	22
38414 (Barrow to Barton (including Pits))	Bittern, Goldeneye	30	2	3	0	1	1	29	0	0	0	0	0	1	24	0	0	60
38415 (Barton to Chowder Ness)	Bittern	30	2	0	0	14	3	28	3	0	0	0	0	12	55	0	0	115
38417 (South Ferriby)		31	1	0	0	0	0	16	0	0	0	0	0	0	7	0	0	23
38418 (Read`s Island Flats)	Ringed Plover, Shelduck, Teal	31,32,33	0															
38419 (Humber Estuary (South Inner) - Sector B3)	Wigeon		0															
38423 (Alkborough Flats)		35	1	0	0	16	0	18	0	0	0	0	0	0	28	0	0	62
38424 (Humber Estuary (South Inner) - Sector B1)		38	0															
38430 (Blacktoft Sands)	Bittern, Golden Plover, Lapwing, Mallard, Teal, Wigeon	36,37	1	0	0	0	0	3	0	0	0	0	0	0	1	0	0	4
38432 (Faxfleet to Brough Haven)	Lapwing, Shelduck, Wigeon	38	3	0	0	2	7	25	0	0	0	0	0	0	10	2	0	46
38433 (Brough Haven to North Ferriby)	Pochard		2	0	0	1	5	19	0	0	0	0	0	0	21	0	0	46
38434 (North Ferriby to Hessle Haven)			3	0	0	0	14	50	0	0	2	11	0	6	17	0	0	253

WEBS Sector	Key Species from Core Count	Map Refs for key locations	No. of vantage points	Person working on boat	Bait digger	Birdwatcher	Cycling	Dog walker	Fishing /angling	Horse Riding	Jogger	Kids playing (with or without parents)	KiteSurfer on water	Picnic	Walking / rambling (without dog)	Wildfowling/shooting	Windsurfer on water	Total People (all activities)
															0			
38436 (Hessle to Hull)			0															
38440 (Hull to Paull)	Black-tailed Godwit, Golden Plover	39,40	1	0	0	0	0	27	23	0	0	3	0	0	17	0	0	70
38441 (Paull to Stone Creek (Cherry Cobb Sands))	Bar-tailed Godwit, Curlew, Dunlin, Golden Plover, Grey Plover, Lapwing, Mallard, Redshank, Ringed Plover, Shelduck	41,42,43	0	1	0	7	3	4	0	0	0	0	0	0	5	0	0	26
38442 (Stone Creek to Patrington)	Bar-tailed Godwit, Curlew, Grey Plover, Mallard, Shelduck	43,44	1	1	0	7	0	1	0	0	0	0	0	0	3	0	0	13
38443 (Patrington to Easington)	Bar-tailed Godwit, Curlew, Dunlin, Grey Plover, Knot, Shelduck, Whimbrel	45,46	2	0	0	13	3	11	0	0	0	0	0	0	11	0	0	39
38444 (Spurn Head)	Cormorant, Dunlin, Knot, Little Tern, Oystercatcher, Redshank, Ringed Plover, Sanderling, Shelduck, Whimbrel	46,47,48,49	6	0	47	32	5	19	7	2	0	8	0	0	118	0	0	238
38905 (Immingham Docks)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
38907 (River Humber - Howdendyke to Whitgift)			0															
38921 (Winteringham Haven)	Shelduck, Teal	31,34	2	18	0	0	0	21	0	0	1	0	0	0	10	0	0	50

6.6 It is also possible to consider the key sites shown in Map 6.1 in relation to the car-park data, and identify which sites are the 'busiest' – at least in terms of visitors arriving by car. We know that visitors typically stray around 550m from access points (this is the median distance from the interview point to the mid-point of interviewee's routes). We therefore drew a buffer of 550m around each of the key sites mapped in 6.1 and then determined the number of car-parks, number of parking spaces and mean number of parked cars counted around each key site. Six of the key sites mapped contained a high number of parking spaces, over 180 within 550m, these were:

- Site 14 at Cleethorpes (474 spaces, 104 mean number parked cars);
- Site 30 at Barton, either side of Bridge (474 spaces, 52 mean number parked cars);
- Site 6, the intertidal areas at Donna Nook (402 spaces, 26 mean number parked cars);
- Site 7, behind the seawall at Donna Nook(402 spaces, 26 mean number parked cars);
- Site 1 between Saltfleetby and Mablethorpe (190 spaces, 13 mean number parked cars);
- Site 46, the large area of intertidal habitat west of Spurn, off Easington (186 spaces, 31 mean number parked cars).

6.7 Site 13 (just to south east of Cleethorpes) was also notable in that although the number of parking spaces within 550m was relatively low (35 spaces), the mean number of parked cars counted was relatively high, compared to those listed above, with the mean count being 23.

Locations where access and birds coincide

6.8 Using the information in Table 32, the questionnaire, parking, vantage point and route data and considering the bird interest, we have identified the following areas as potentially key areas where they may be particular conflicts between access and bird interest:

- The Saltfleetby area: dog walkers, walkers etc. in vicinity of hen harrier roost.
- Saltfleet: bait digging, wildfowling and dog walking around area used by feeding brent geese.
- Donna Nook: walkers and dog walkers in vicinity of area used by feeding brent geese and golden plover roost/feeding area.
- Horseshoe Point/the Fitties/Northcoates Point: dog walkers around autumn/winter golden plover & lapwing feeding sites/roost; kite surfers around tern roost (late summer) and brent goose feeding areas (winter). Wildfowling in areas used by brent geese and also autumn/winter golden plover & lapwing feeding sites/roost
- Cleethorpes: Dog walkers, walkers, kite surfers and horse riders in the vicinity of the wader roosts.
- Pyewipe: Fishermen and dog walkers in the vicinity of area used by feeding and roosting waders (both sides of sea wall). This area particularly important for black-tailed godwit November-January.
- Halton Marshes: dog walking, walking, wildfowling and fishing in vicinity of fields/marshes used by feeding/roosting golden plover, ruff, lapwing and curlew. Also key area for short-eared owls.

- Waterside/Pasture Wharf/Far Ings: dog walking, walking and wildfowling. The pits/marshes (inland of seawall) support breeding birds that include marsh harrier, bittern and avocet; winter/feeding area for a number of duck.
- Read's Island/Read's Island Flats: wildfowling, dog walkers along shore and water-craft (sailing) in channel. The area supports breeding avocet and marsh harrier; in winter range of species including pink-footed goose roost
- Winteringham Haven area: wildfowling, dog walking, walking in vicinity of autumn roost site for golden plover, lapwing, ringed plover, dunlin and curlew
- Alkborough Flats: dog walkers, walkers, joggers, wildlife watching, wildfowling. Area important for breeding birds (including avocet), wintering and on-passage.
- Faxfleet/Whitton Island: wildfowling, dog walking in vicinity of key area for birds, with bird interest including breeding birds (including marsh harrier and avocet), winter roost and feeding area in winter for range of wildfowl and waders
- Paull area: dog walking, walking, fishing around areas used by feeding black-tailed godwit in the autumn and winter roost/feeding site for redshank, lapwing and golden plover
- Cherry Cob Sands: relatively low numbers of shore based access (dog walking, walking) and wildfowling in vicinity of area used for winter feeding/roosting by large numbers of waders on fields/marshes (golden plover and lapwing) and intertidal.
- Stone Creek: wildfowling, dog walking and walking where salt marsh is important for short-eared owl in winter. This location also an anchorage point and therefore boat access potentially an issue.
- Patrington-Easington: relatively low levels of access but range of activities (dog walking, walking, wildfowling, bait digging) in vicinity of hen harrier/raptor roost, high tide wader roost and large expanse of mudflat important for feeding waders.
- Beacon Lagoons: beach activities, wildlife watching in vicinity of little tern colony and wader roost site
- Spurn Head: bait digging, walking, wildlife watching. Head holds wader roost and intertidal areas are used by feeding waders.

Activities

6.9 We can summarise key activities as:

- airborne activities
- bait digging
- beach activities
- dog walking
- fishing
- horse riding
- kite surfing
- walking
- wildfowling
- wildlife watching

6.10 An important consideration is how these activities may change in the future. In general there is evidence that access to the natural environment is increasing (e.g. Balmford *et al.* 2009) and the volume of recreational visits to the countryside in the UK has

increased (TNS Research International Travel & Tourism 2010). There are no precise records of dog ownership at national, regional or even local scale, but it would seem that numbers of dogs are relatively stable and lie in the region of between 7 and 8 million within the UK (Jenkinson 2011). Additional housing and development local to the Humber – for example around Hull, Grimsby or Cleethorpes may result in increased dog walking around the estuary. While dog walking and short walks are linked to local residents, watersports users, day walkers, family visits and wildlife watching will involve people visiting from a wider radius. Changes in popularity of these activities, or changes in housing and the local population will lead to increases in these activities too. Many sporty-type outdoor activities within the UK are increasing, for example walking and mountain biking (TNS Research International Travel & Tourism 2010). From the interviews it is clear that motorised craft, personal watercraft, speed boats, power boats and kite surfing have all increased on the Humber. The interviews highlighted the increased use of the upper areas of the river by personal water craft and this was linked to the launching access from the public slipway at Hessle.

Comparison with other European Sites

6.11 In paragraph 6.8 we highlighted areas where the recreational data has identified activities which occur on are near areas known to be of importance for the SPA bird interest. These locations are simply areas where there may be scope for disturbance. No ornithological fieldwork was conducted as part of this report and it is therefore beyond the scope of this work to identify the extent to which disturbance is actually occurring. The WeBS alerts, while slightly dated, indicate that there are site specific issues for relatively few bird species on the Humber. This does not necessarily indicate that disturbance is not an issue on the Humber, as access levels may have increased at other sites too, and therefore disturbance would not necessarily be expected to result in site specific declines.

6.12 We can look to work at other SPAs sites where similar visitor work has been undertaken in conjunction with ornithological fieldwork. Footprint Ecology has undertaken similar visitor work on a number of different European sites and we summarise the results in Table 33. Some caution is required in drawing direct comparisons as the studies differ slightly in approach (the Exe work for example included focused survey effort at slipways and launch points to interview people undertaking watersports), fieldwork survey effort etc., and also (perhaps most importantly) the survey points were not selected at random. However we believe a comparison between the various studies is useful in indicating the levels of access and scale of impacts.

6.13 The information in Table 33 would suggest that the levels of access on the Humber are slightly lower compared to some of the other coastal SPA's surveyed (the levels of access on the Humber are broadly similar to those on the North Kent sites). The Humber appears to draw people from a relatively wider area and the survey locations seem to attract a high proportion of visitors travelling by car. While dog walking is clearly important, the percentage of dog walkers on the Humber is less than the other

sites. A relatively low proportion of routes appear to involve access on to the beach or intertidal.

6.14 The Humber Estuary is different in scale to the other sites considered in Table 33, particularly in the expanse of intertidal habitats and soft sediments. Its large size and the inaccessibility of some of the intertidal areas will mean that in some areas disturbance is perhaps less likely to be an issue than on small, narrow estuaries such as the Exe. For the bird species that feed on intertidal habitats of the Humber, there is likely to be at least some undisturbed feeding areas. This means that large populations of birds that use the site may be able to disperse widely and find undisturbed feeding areas at low tide, but at high tide these large numbers may be concentrated at a limited number of roost sites, when disturbance may be more likely to be an issue. The Humber Estuary also supports a high level of commercial activity, which is not considered within this report but may set the estuary apart from other sites.

Table 33: Summary of visitor work and disturbance work undertaken by Footprint Ecology at other sites in the UK. In summary of disturbance work, major flights are those involving birds flushed at least 50m.

Site	Solent	Exe	North Kent	Humber (winter survey data only)
References	Fearnley *et al.* (2010); Stillman *et al.* (2012)	Liley & Cruickshanks (2010); Liley *et al.* (2011)	Fearnley & Liley (2011); Liley *et al.* (2011)	This report
SPAs	Solent & Southampton Water; Chichester Harbour; Portsmouth & Langstone Harbours	Exe Estuary	Medway Estuary & Marshes; Swale; Thames Estuary & Marshes	Humber
Survey season (visitor work)	Winter 2009/2010	February & March 2010	February & March 2011	January-February 2012
Number of survey points	20	8	21	20
Number of hours visitor survey work	320	144	336	320
Number of interviews conducted	784	586	542	502
Interviews per hour	2	4	2	2
Total people in interviewed groups	1322	1138	930	907
Total Dogs with interviewed groups	550	307	502	335
Total of people counted passing interviewer (tally data)	4341	1374	1398	2177
Total people per hour	14	10	4	7
% of groups with at least one dog	53	38	65	45
% groups walking	42	38	23	24
% groups arriving by car	46	60	63	70
Median distance (km) from survey location to home postcode for interviewed groups who arrived by car	4	9.8	4.2	8.4
Main two reasons given by interviewees as to why they visited particular area	Close to home Attractive scenery / views	Attractive scenery Close to home	Close to home Good for dog	Close to home 'Other'
Number of visitor routes	774	586	507	487
Median route distance of dog walkers (km)	2.55	1.6	2.6	1.86
Median route distance of walkers	3.10	2.1	3.0	2.29
% of visitor routes that went onto the beach or intertidal	25	75 (targeted surveys at water sport users)	23	18
Summary of disturbance work	8% of observations involved major flight; 83% no response. Modelling shows current impacts of disturbance with reduced survival of dunlin, ringed plover, curlew and oystercatcher.	14% of observations involved major flight; 62% no response. Evidence that bird numbers lower when more people present	13% major flight; 74% no response. Weak/little evidence that numbers lower when more people present	

Implications for management of access on the Humber

6.15 The Humber Management Schemes current action plans[5] recognise that recreation is largely unregulated and therefore very little information is available on visitor numbers, the types of activities which are carried out and if these activities have an impact on the Humber Estuary designated features. As a result of this, the action plan for recreation and tourism sets out an overall objective to understand if significant recreational disturbance is taking place, and where necessary, to put appropriate management in place and to engage with organisations and people undertaking activities to encourage sensitive use of the Humber Estuary European Marine Site.

6.16 In previous sections we have considered the access data with the bird data and identified where there may be particular concerns or scope for conflict. We have considered how access may change in the future and have drawn comparisons with other European sites in terms of the levels of access. Without targeted bird fieldwork we cannot identify whether birds are actually being disturbed, and ideally this information would be available prior to thinking in detail about management implications.

6.17 However, maintaining the integrity of a European site is not simply a case of allowing deterioration to the point at which Natural England advises that it will cross the threshold into failing its conservation objectives. Rather, competent authorities must seek to ensure that the ecological robustness of the site and its ability to function as a thriving ecosystem into the long term, alongside fluctuating natural cycles and processes, is not compromised.

6.18 It would seem sensible that ornithological fieldwork should be conducted to inform the current level of impact, following the recommendations set out in the previous disturbance report (Cruickshanks *et al.* 2010a). However, based on the work in this report it is possible to identify where visitor access is concentrated around the Humber and the types of access occurring in particularly sensitive locations. We have established contact with a number of different users and user groups and have collected information that helps to inform how management might be successful. The list of key locations, set out in paragraph 6.8 provides a potential focus for developing management at particular locations and we have also identified the principal activities.

6.19 Even without evidence on the scale of impacts of recreation, there is justification in developing access 'management' measures. Access levels are likely to continue to increase, and by acting strategically it is possible to work with recreation groups/users, enhancing the opportunities and experience of visitors, yet ensuring that impacts from recreation are controlled or minimised. There is considerable merit in developing a suite of measures at a Humber wide scale rather than site-by-site, as at an estuary wide scale, it is possible to ensure issues are not simply deflected to different parts of the shoreline and it is possible to create a wider range of opportunities for access and provision of

[5] http://www.humberems.co.uk/management/

recreation. Any management measures that are set up in a proactive, rather than reactive fashion (as problems arise) are likely to be more successful.

6.20 We set out a summary list of possible approaches to managing access in Table 34. It can be seen that a range of measures are possible to minimise disturbance, for example careful siting of development, influencing which sites people visit, where people go within sites and how they visit. These options range from soft measures and proactive work, to enforcement. Conclusive evidence that the different measures work is limited, but within the table we summarise examples and, where available, reference studies showing the effectiveness of the different options.

6.21 It is important to recognise that access to the countryside is important and brings nature conservation benefits in itself. While management measures might seek to control or limit access in some areas, the overall aim should be to enhance existing recreation experience and provide recreation opportunities such that access and nature conservation interests are not in conflict.

Table 34: Options to Reduce Disturbance Impacts

Management option	Description	Examples and Notes
1. HABITAT MANAGEMENT		
New habitat creation	Creation of new habitat for the interest feature in areas away from human disturbance. Potential to be carried out in combination with managed realignment schemes and/or disposal of dredgings.	Effectiveness of 'refuges' shown by Madsen, in Denmark (Madsen 1993, 1998). Artificial roost sites have been created, for example at Hartlepool (Burton, Evans, & Robinson 1996)
2. PLANNING & OFF-SITE MANAGEMENT MEASURES		
Site development away from sensitive sites	Much recreational use to sites is local, for example from people living within a short drive or walk of sites. Planning development at a strategic level is a way to reduce the long term future pressures of increased recreation from development. Needs to be taken into account during formulation of Local Development Frameworks.	Relevant core strategies for authorities adjacent to The Thames Basin Heaths SPA, the Dorset Heathlands SPA and the Breckland SPA all have development exclusion zones.
Planning conditions on adjacent development (land)	Urban design and planning conditions (such as Section 106 agreements) can ensure that planting, screening, careful routing, provision of access infrastructure (boardwalks, marked paths, steps etc) are incorporated into new developments to influence visitor flows around sites and minimise the potential of people to cause disturbance.	Design for development adjacent to Poole Harbour at the site of the old power station included a ditch to ensure access kept back from foreshore (Hoskin *et al.* 2007).
Provide alternative recreational facilities	Provision may need to be combined with other measures such as education and management on the designated site. Likely to need to be carefully designed and targeted to provide a viable alternative. Targeting for dog walkers would need to ensure dog friendliness (Edwards and Knight, 2006) and suitable routes (e.g. Liley et al., 2006c, Liley et al., 2006d). For water-based activities, gravel pits or similar may need careful landscaping and particular types of infrastructure.	'SANGS' (suitable alternative natural greenspace) have been promoted around the Thames Basin Heaths and the Dorset Heathlands SPAs. Currently little evidence has been collated to demonstrate effectiveness (Clarke, Sharp, & Liley 2008; Liley, Underhill-Day, & Sharp 2009; Sharp 2010). In coastal environments likely only to work in circumstances where use is not coastal specific, e.g. local daily dog walk.
Provision of designated access points for water sports	Provision of public slipways, trailer & vehicle access to shore etc in predetermined locations where boat access is likely to be away from nature conservation interest.	
Attract visitors to less sensitive areas; discourage access to sensitive areas	Provision of attractions/facilities such as toilets, food, improved walking surfaces, hides etc. Manage demand through car-park costs and capacities, restriction of on-road parking by wardening. Establish coast paths where there are gaps to minimise access to beach, realign footpaths where necessary.	Few examples exist where such infrastructure has been reviewed and designed across a wide area to focus visitor pressure away from sensitive areas.
3. ON-SITE ACCESS MANAGEMENT		
Restrict/prevent access to some areas within the site	Potential to restrict access at particular times, e.g. high tide and particular locations (roost sites). Temporary fencing, barriers, diversions etc all possible.	Exclosures to provide safe nesting areas for terns and breeding waders exist at numerous sites such as Holme NNR, Scolt Head NNR, Dawlish

Management option	Description	Examples and Notes
		Warren, Pagham Harbour LNR and Walberswick NNR. There are few examples of successful exclusion of people in the winter from roost sites etc. At Dawlish Warren a warden is present through the winter at high tide and visitors are redirected according to where the birds are.
Provide dedicated fenced dog exercise areas	Allowing dogs off leads etc in particular locations that are not sensitive for nature conservation or other reasons may increase their attractiveness to dog walkers.	Dedicated dog exercise facilities exist at Sutton Heath in the Suffolk Sandlings SPA. The enclosure is outside the SPA and draws visitors from a wide area (Cruickshanks, Liley, & Hoskin 2010b).
Zoning	Designated areas for particular activities. Often zones are set out in a code of conduct and prevention of use for the areas outside the zones is enforced through byelaws.	Dedicated 'zones' for particular activities exist on various estuary sites around the UK.
Infrastructure to screen, hide or protect the nature conservation interest	Screens, hides, embankments etc are commonly used to direct visitors along particular routes and screen people from birds or other features vulnerable to disturbance. Such infrastructure can also provide enhanced viewing facilities and opportunities for people to get close to wildlife without causing disturbance. Path design can enhance the extent to which people stray or roam from the path. Boardwalks etc. can protect vulnerable habitats.	Wide range of techniques and infrastructure. Many nature reserves commonly use such infrastructure to allow access and good viewing of wildlife. Less potentially relevant on greenspace sites where people are not necessarily visiting to view/experience wildlife.
Management of car-parking	Car-park spaces can be redistributed around a site, parking closed in some areas, parking fees modified (e.g. encouraging people not to stay too long) or a permit system be instigated to limit use of car-parks	Car parks have been temporarily closed as part of CRoW access restrictions on some sites (e.g. sites in Breckland with breeding stone curlews) and have been permanently reduced in size or closed at a number of sites such as the New Forest (to considerable public opposition) and Burnham Beeches (very successful). Evidence from Cannock suggests that results can be unpredictable (Burton & Muir 1974).
Path design and management	Surfacing, path clearance and other relatively subtle measures may influence how people move around a site and which routes they select.	Work in the Pennines demonstrated that path resurfacing resulted in a change in people's behaviour and a resulting reduction in disturbance (Pearce-Higgins & Yalden 1997).
4. EDUCATION, COMMUNICATION TO PUBLIC AND SITE USERS		
Signs and interpretation and leaflets	Provision of informative and restrictive signs, and interpretive boards. Directions to alternative less sensitive sites. General information on the conservation interest to highlight nature conservation interest/importance.	Interpretation boards, signs and leaflets are widely used around the UK. Provision of signage and wardening have been shown to result in enhanced breeding success for little terns in Portugal (Medeiros *et al.* 2007).
Codes of Conduct	Guidance on how to behave to minimise impacts is promoted at a range of	On the Humber a generic code of conduct includes different sections for

Management option	Description	Examples and Notes
	sites, through websites, leaflets, interpretation etc. These are sometimes enforced by byelaws and other control measures (see section 5).	each type of activity and the code is available as a leaflet or a download from the Humber Management Scheme website[6]. Scottish Natural Heritage have produced comprehensive guidance titled the Marine Wildlife Watching code, covering cetacean boats, otters, seabirds etc[7].
Wardening	In addition to an enforcement role (see 4e above) wardens can provide a valuable educational role, showing visitors wildlife etc.	Many sites have wardens who fulfil a range of roles, including interacting with the public and education. Can be both on-site and off-site (e.g. school visits).
Provision of information off-site to local residents and users.	Local media, newspapers etc can provide means to highlight conservation importance of sites and encourage responsible access. Educational events, provision of items for local TV/other media. Information can be made available in local shops, tourist centres etc. Potential to promote non-designated sites, for example through web / leaflets listing, for example, dog friendly sites.	In Dorset, Natural England provide a dog-users website which gives information to dog walkers, it includes codes of conduct and highlights places to walk, indicating which sites requires dogs to be on a lead and when[8] . Many estuaries have management partnerships that host regular forum meetings, estuary festivals and other events that bring local users together and can provide a means of conveying information.
Contact with relevant local clubs	Agreed codes of conduct and self-policing can be set up with individual groups and provide a means of ensuring users are aware of how to act responsibly (e.g.water-sports club revoking membership for anyone caught speeding (Defra, 2004)).	A range of examples exist, for example the Jersey Canoe Club has a code of conduct for wildlife encounters[9]; In Pembrokeshire a marine code exists in addition to legislation as a voluntary agreement to which all major local wildlife tour boat operators, sub aqua diving organisations, personal water craft organisations, sailors and sea kayakers etc. have signed up to [10]
Establishment of Voluntary Marine Reserves (VMRs)	By agreement of interested parties.	There are a number of sites around England, such as Purbeck, Looe St. Abbs and Seven Sisters.
Off-site education initiatives, such as school visits etc	Proactive education work with local communities, raising awareness and highlighting local issues.	

[6] http://humberems.co.uk/downloads/Codes%20Of%20Conduct%20PDF.pdf
[7] http://www.marinecode.org/documents/Scottish-Marine-Code-web.pdf
[8] http://www.dorsetdogs.org.uk/
[9] http://www.jerseycanoeclub.co.uk/docs4dl/wildlife_coc.pdf
[10] http://www.pembrokeshiremarinecode.org.uk/code%20conduct.htm

5 ENFORCEMENT		
Dog control orders	Orders to keep dogs on leads, restrict specific access at certain times etc[11].	Difficulties in getting measures agreed, particularly when people have been using an area for a long period. Difficulties in policing. Peer pressure could be effective. Examples include Stanpit Marsh (Christchurch Harbour), the Hayle Estuary (RSPB Reserve) and Chichester Harbour.
Covenants regarding keeping of pets in new developments	Covenants prohibiting the keeping of cats and / or dogs for example in flats where a management company could enforce the restriction.	In a review of planning appeal decisions in the Thames Basin Heaths SPA (Hoskin and Tyldesley, 2006), a number of cases rejected the use covenants as ineffective and / or unenforceable and in ten appeals, such covenants were found to be insufficient to avoid harm to the SPA because they would not deter other recreational visits not related to dog walking.
Legal enforcement	Byelaws can be established by a range of bodies including local authorities, the MOD, National Trust, Parish Councils etc. Other options include special nature conservation orders or prosecution under SSSI legislation.	Policing of watercraft zoning, speed limits etc, with fines or other penalties for infringement[12]. Enforcement facilitated when a system of permits and vessel registrations is in place. Byelaws also often used for activities such as kite surfing (e.g. the Hayle Estuary and at Seaforth). Byelaws exist at a range of sites to control bait digging, e.g. The NNR part of Teesmouth and Cleveland Coast SPA/EMS
Wardening	Wardens have both educational and enforcement roles. With respect to the later, wardens can provide direct contact and intervene when they observe particular activities (such as dogs off the lead on mudflats). The ability of a warden to control disturbing activities is clearly related to whether control measures are in place, and their nature. The more specific and statutory in nature the control, the greater the potential for enforcement by a warden.	Many sites have wardens who fulfil a range of roles, including interacting with the public dealing with disturbance issues. At Teesmouth and Cleveland Coast SPA/EMS, one targeted patrol per week allows NE on-ground presence to be demonstrated, but is very resource intensive.
Limiting visitor numbers	Visitor numbers capped, for example through tickets, permits or a similar system.	Commonly used in the past at various nature reserves around the UK such as Minsmere. Widely used in American National Parks.

[11] See defra guidance at: http://www.defra.gov.uk/environment/quality/local/legislation/cnea/documents/dogcontrol-orders.pdf
[12] Model byelaws provided at: http://www.mcga.gov.uk/c4mca/cons_mca_guidance_pleasure_boat_model_byelaws_amenda.pdfare.

Specific measures for the Humber

6.23 Table 34 provides an overview of options. From this we can suggest measures that seem worth more detailed consideration, and summarise these below. The list is tentative as the bird disturbance work has not been conducted. It is also imperative that any initiatives are developed by locally based staff or users themselves, and therefore the list should be seen as a starting point for discussion and for developing ideas. We structure the list by activity/topic and we include ideas for future monitoring and research.

Airborne activities

6.24 There is clearly merit in establishing wider and better contact with local users. On-line forums and via airfields are likely to be the best means of establishing dialogue. Airborne recreation is covered within the existing codes of conduct for the Humber[13], however it would be possible to build on this code and expand the content. More detailed guidance could be established that sets out clear guidance with relation to disturbance to wildlife. Perhaps the most fundamental elements should be a map setting out sensitive areas – 'no fly zones' – for which map 6.1 in this report could be a starting point.

6.25 The interviews highlighted that airborne users would like to see evidence that they have an impact on birds, and also that they were not singled out – for example in comparison with military use. Any codes of conduct issued should refer to flight heights in feet, rather than meters.

Bait digging

6.26 Bait digging is particularly focused around Spurn and around Cleethorpes (where a permit system is in place). There is an existing code of conduct[14] and already some direct communication between diggers at Spurn and reserve staff. Ideally signage, continued circulation of codes of conduct and face-to-face contact with local diggers should ensure best practice and minimise impacts. Should there be further concerns, triggered by monitoring (see monitoring section) then increased wardening at key times and enforcement could be considered. There may be options to reduce disturbance by specifying times when diggers access the shore (waiting for the tide to drop well away from mean high water for example) and limiting digging to particular areas. Careful monitoring, involving Natural England, is essential.

Beach Activities

6.27 General beach activities tend to be focused on sandy parts of the coast, particularly from Cleethorpes towards the mouth of the estuary. Key locations include Saltfleet, Horseshoe Point/Northcoates Point area, Cleethorpes and Spurn. The critical time of year is the autumn passage period, when good weather, high visitor numbers and birds on passage coincide. At Easington there are also the breeding little terns, and an existing wardening scheme is in place.

[13] http://humberems.co.uk/downloads/Codes%20Of%20Conduct%20PDF.pdf
[14] http://humberems.co.uk/downloads/Codes%20Of%20Conduct%20PDF.pdf

6.28 The key locations for birds are shown in Map 6.1. Potential options to minimise impacts are temporary fencing, wardening and education/awareness raising. Fencing only works above the tideline and can be unsightly. Wardens can directly talk to visitors, show people birds and ask people to move in particular directions. While effective, this approach is also costly. Wardens can increase awareness, other options for awareness raising include signage and leaflets – these should contain simple messages relating to disturbance and be clear as to what visitors should do to minimise their impacts.

Dog walking

6.29 Dog walking was a ubiquitous activity recorded during the survey work and vantage point surveys. It was the most commonly recorded activity (e.g. 42% of interviews during the winter). Dog walking is the most common cause of birds being disturbed at many estuary sites and tends have a disproportionate impact compared to other activities, at least in terms of birds being flushed (Liley *et al.* 2010b, 2011; Liley & Fearnley 2011; Liley, D. & Fearnley, H. 2012).

6.30 Promotion of sites for dog walking, for example on the internet, would be a potentially useful way of directing dog walkers to locations where they are welcomed and can let dogs off the lead without disturbing birds. Such a system could be 'live' in that sites can be flagged or colour coded according to their sensitivity. Promoted sites could include inland sites outside the SPA and be extended more widely than just the Humber.

6.31 Sites where there are no disturbance opportunities could be made more dog friendly (see for example Edwards & Knight 2006; Jenkinson 2010, 2011), which was a factor that came out clearly in the interviews. Dog friendliness can be promoted through for example the provision of fenced areas to ensure dog safety, safe parking, no conflicts with other users, places for dogs to drink etc.

6.32 Directing dog walkers within sites may also be a means of reducing disturbance. Providing circuits and clear paths (for example below embankments or behind scrub) is a way of minimising the visual impact of walkers and their pets.

6.33 Interpretation and leaflets with clear, simple messages relating to disturbance would be useful in many locations. Dog walkers may not be aware that brent geese differ from Canada geese for example, or that their dog flushing a few birds is likely to cause a problem. Wardening may also be effective.

Fishing

6.34 Fishing takes place mostly at high tide and in most cases is unlikely to cause much disturbance to birds unless taking place near a high tide roost. Particular locations where there is potentially cause for concern are at Halton Marshes and Pyewipe (high tide wader roost).

6.35 Bird fieldwork may highlight the extent to which this activity is a problem. In the absence of such information, a review of parking and vehicle access at these locations may provide a means of limiting impact and focusing activity to locations where there are no disturbance impacts.

Horse Riding

6.36 Horse riding was recorded around Cleethorpes, where the issues in particular involve wader roosts. Horse riding does also take place near Spurn and towards Saltfleet. Tracing the groups using these areas and direct contact with stables/equestrian centres should be a means of ensuring impacts are minimised. There should be potential to avoid impacts by riders selecting routes that take them away from key locations or only riding when the waders are not present (e.g. low tide or all tide states between April-July).

Kite surfing

6.37 Kite surfing was limited to Cleethorpes/Humberston and Horseshoe Point. There is already a code of conduct at Cleethorpes, with clear guidance as to where kite surfers can surf/fly and requiring all users to have insurance. Kite surfers using this location have set up a local group to provide a point of contact.

6.38 It would be useful to discuss options for reducing disturbance with kite surfers. The route map (5.7) would suggest that kite surfers are surfing around the key areas for birds, however the birds will only use the areas when sand/mud are present. The key bird locations are the wader roost sites and the tern roost (late summer/early autumn). Disturbance impacts could minimised by kite surfers only surfing around high tide and only accessing the water/landing at selected locations. Maps that define kite surfing areas should clearly set out where the areas that are used by the birds are.

Wildfowling

6.39 Wildfowlers did not feature much in the vantage point counts or face-to-face survey work. By the nature of the activity, users are unlikely to be picked up by such survey methods. Logs kept by the wildfowling clubs record the number of visits and hours on the foreshore, number of shots and bag returns; areas where wildfowling can take place are mapped in detail and actively wardened; wildfowling is perhaps the most regulated of all the recreational activities taking place around the Humber.

6.40 Although some wildfowling areas overlap or are adjacent to key breeding bird areas it is unlikely that wildfowling activity will result in the disturbance of breeding birds given the wildfowling season ends on 20th February.

6.41 There is clearly scope for impacts from disturbance, given the locations where wildfowling takes place. It would be useful to have a more detailed picture of how much time wildfowlers spend on site and levels of disturbance caused by this activity. There is potentially scope for more consistent and coherent monitoring of time wildfowlers spend on the estuary and ornithological work would be useful to clarify the impacts in terms of disturbance. Permits and consents should be reviewed regularly.

Wildlife Watching

6.42 People visiting sites to view wildlife might be expected to cause less disturbance than some other users who are perhaps not as aware of the wildlife interest. However, such users can cause disturbance, particularly when trying to get close to photograph wildlife.

6.43 At many sites, such as Alkborough, Blacktoft, Far Ings and Spurn, facilities such as hides, screens and marked paths are in place to allow people to view wildlife without causing disturbance. Such facilities can be extended to other locations and some of the general measures (see below) may also be effective.

General Measures

6.44 The data presented within this report provides a starting point for a review of parking around the Humber. A very small proportion of interviewees (less than 1%) indicated that good and easy parking was a motivation for choosing the location where interviewed. This relatively low level of response may reflect that there is a wide range of easy parking options around the Humber, and therefore scope to modify the distribution and range of places where people can park.

6.45 The current situation is that there are 189 different locations where people can park, with a total of some 3691 spaces of which around two thirds are on the south bank. Sixty-six car-parks have 5 or less spaces, i.e. are particularly small. In general, if seeking to reduce disturbance impacts, it makes sense to reduce the range of parking locations such that access levels are more focused in particular locations, yet the same (or increased) number of spaces are provided. The interview data indicates that people would visit sites more if more formal parking was provided. Lots of scattered, small parking sites will lead to diffuse access spread over a wide area, whereas a small number of car-parks will lead to access being focused in particular areas. Parking charges, while often unpopular, merit consideration and should be part of the review. Charges do not have to be implemented all year round or on all days, for example at Burnham Beeches in Buckinghamshire, visitors can leave a donation during the week if they wish, and charging is only compulsory at weekends and bank holidays, which are the busiest times. Such an approach helps to reduce the very high levels of use at weekends and provides additional funding towards management on the site.

6.46 Around one third of interviewees suggested that better paths or routes would lead them to visit particular locations more. Routing visitors through the use of waymarked routes, boardwalks, signs and even informal barriers (such as allowing scrub to grow up) can provide means to distribute people within sites. In many locations encouraging people to walk on particular sides of embankments/sea walls rather than along the top or on the side with particular wildlife interest would reduce disturbance.

6.47 Awareness raising and education initiatives at an estuary wide scale will provide potential to ensure messages relating to disturbance are consistent and clearly communicated. Face-to-face contact, signage, leaflets and web-based media that use the same branding, approach and design help to communicate an estuary-wide message for visitors. Such consistency is important as many visitors may not recognise that the parts of the SPA that are not nature reserves are important for birds.

6.48 Another common theme emerging from the interviews is that estuary users are keen to engage with the Humber Management Scheme and willing to comply with guidance to minimise potential impacts to the birds and their key locations. However, this guidance and the key supporting messages, needs to be clear, well thought out and consistent.

There would also be merit is designing more technical guidance targeted at the specific user groups and the taking time to engage with the groups.

Additional research and monitoring

6.49 Ornithological fieldwork to identify the extent to which bird numbers/distribution do relate to access levels and the extent to which different activities cause disturbance was set out as a recommendation in Cruickshanks *et al.* (2010a). It was clear from the interviews that some user groups wanted to see evidence that their activity caused disturbance, and the bird work would therefore be a useful compliment to this report. It would be useful to have an understanding of the extent to which activities such as angling and wildfowling do cause disturbance, compared to other activities such as dog walking.

6.50 The data presented here provides a baseline data set that can be used to determine changes in access levels. Future monitoring is important to determine how successful any management approaches are and to pick up changes in use – for example as different activities become popular. The car-park counts potentially provide the best means of determining how overall visitor numbers and access patterns change, and regular repeats of these (for example at five year intervals) will provide useful information.

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Appendix 1 – Visitor survey questionnaire

Humber 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 Humber Management Scheme to look at current recreational use of the area.

Q1 Which of the following best describes your situation today? *Read list. Tick one only.*

	1 On a day trip/short visit and travelled from home
	2 On a day trip/short visit & staying with friends or family
	3 On holiday in the area, staying away from home
	4 Other: (note details below):

Main	Other	**Q2 What is the main activity you are undertaking today?** *Do not prompt.* ***Tick only one main activity and*** *tick as many other activities as visitor gives*
		1 Dog walking
		2 Walking
		3 Jogging/power walking/Nordic walking
		4 Outing with children/family
		5 Cycling
		6 Wildlife watching
		7 Windsurfing
		8 Kite surfing
		9 Boating (give details in free text)
		10 Bait Digging / Cockling
		11 Canoeing / kayaking
		12 Fishing
		13 See the sea and enjoy the scenery
		14 Meet up with friends
		15 Off road/vehicle access
		16 Airborne activities (small planes etc)
		17Wildfowling
		18 Other/further detail:

Q3 How long have you spent / will you spend in the area today? *Tick one 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 part of the coast? *Tick closest answer. Tick one only. Only prompt if interviewee struggles.*

	1. Daily
	2. Most days (180+ visits)
	3. 1 to 3 times a week (40—180 visits)
	4. 2 to 3 times per month (15-40 visits)
	5. Once a month (6-15 visits)
	6. Less than once a month (2-5 visits)
	7. Don't know/First visit

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 Only between dusk and dawn
	7 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 (Mar-May)		4 Winter (Dec-Feb)
	2 Summer (Jun-Aug)		5 Don't know / 1st visit
	3 Autumn (Sept-Nov)		6 Equally all year

Q7 How did you get here? What form of transport did you use? *Tick one only. Do not prompt.*

	1 Car/Van		4 Bicycle
	2 On Foot		5 By water (boat, canoe)
	3 Public transport		6 Other (please detail)

Q9 What makes you come here, specifically, rather than another local site? *Tick all responses given by visitor in 'other' column. Do not prompt. Tick closest answers then ask* **'Which would you say had the most influence over you choice of site visit today?** *Tick only one in the 'main' column. Tick closest answers. Use text box to detail reasons that didn't fit with categories/extra detail.*

Main	Other		Main	Other	
		1 Don't know/others in party chose			12 Right place for activity (eg kite surf/fishing/good for kids)
		2 Close to home			13 Particular wildlife interest
		3 Quick and easy travel route from home/accommodation			14 Ability to see boats/watch activities on the water
		4 Good/easy parking			15 Substrate type (e.g. Sandy beach)
		5 Feel safe here			16 Good for dog/dog enjoys it
		6 Particular facilities here (provide detail in other text box about facilities)			17 Ability to let dog off the lead
		7 Choice of routes/ability to do different circuits			18 Suitability of area given weather conditions
		8 Quality of this area of coast			19 Particular launching facilities
		9 Rural feel			20 Refreshments/Cafe/Pub nearby
		10 Quiet with no traffic noise			21 Closest coast to home
		11. Habit / Familiarity			22 Not many people
		Other / Extra details			

Q8 Aside from this location, do you visit any other places for similar purposes as you visited here today? *IF YES:* **which locations do you visit most often?** *Do not prompt. Please ask visitor to spell place names as these will be mapped and prompt to elicit whether place is coastal or inland*

Name of location	Coastal or inland?

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 travelled by vehicle) 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 where visitor parked,* **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. Add tideline. Probe whether the route was along shore, seawall, paths, mudflats, on the water please reflect this on the maps with labels to indicate where the visitor walked especially below the tideline.*

GPS USED: Y / N GPS Number: START TIME: END TIME:

Q10 Is/was your route today reflective of your usual route when you visit here for [*insert activity***] .** *Tick one, do not prompt.*

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

Q11 Will/has your visit today involved you walking off paths onto mudflats or open beach? *Tick one*

	1 Yes		2 No		3 Not sure

Q12 What (if anything) influenced your choice of route here today? *Multiple answers ok. Do not prompt. Tick closest answers . Use free text box additional influences or/and detail.*

	1 Weather		6 Muddy tracks/paths
	2 Daylight		7 Followed marked trail
	3 Time		8 Tide
	4 Other people		9 Activity undertaken (e.g. presence of dog)
	5 Group members (kids, less able)		10 Other (please detail in free text)

Free Text: other reasons / detail:

Q13 And in terms of this location, if the following changes were made, would you spend more or less time here for [*insert visitors main activity***]?** *Read out each type of change in turn.*

	more	less	unsure	Comment
Site is busier with more people				
Creation of marked trails and routes with interpretation				
Better path surfacing / routing				
Increased or introduction of parking charges				
Provision of formal car parking				
Dogs required to be on leads				
Presence of warden / beach manager				
Part of shore closed in areas sensitive for wildlife				

Q14 For [*insert visitors main activity***] what features would be necessary to make another site attractive for you to use instead of here?** *Do not prompt. Categorise as appropriate. Multiple answers ok*

	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 / formal 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:

Q15. Are you a member of any group, club or organisations which uses the Humber Estuary for recreation? (eg. BASC, Kite surfing, sailing running, fishing, club).

Details of organisation :

Q16 Do you have any other comments about this area?

Q17 What is your full home postcode? *(this is the most important piece of information required from the survey, please make every effort to record correctly)*
If visitor unable/refusal to give postcode:
What is the name of the nearest village/town? *(Please ensure correct spelling)*

Q17b If visitor is on holiday ask:
Which town/village are you staying in?

Q18 How many of your party fall into the following age categories? *Enter number of people per category*

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

Q19. Are you aware the Humber Estuary is internationally important for wildlife and designated as a European Marine Site? Y / N

To complete once interview has finished. Questionnaire Number : Map ? Y / N

Date:	Number of dogs:	Route Mapped Y / N	Group size (total people):	Location:
Time:	Dog(s) seen off leads? Y/N	Gender of respondent (M / F):	Surveyor:	Interview conducted part was through route (tick if yes)

Appendix 2 – Angling responses to on-line questionnaire

Angling - Humber

SurveyMonkey

1. Roughly, how often do you visit the Humber estuary to fish between August and March? (please select one answer only)

	Response Percent	Response Count
Daily	0.0%	0
Most days (180+ visits)	0.0%	0
1 to 3 times a week (40-180 visits)	23.5%	8
2 to 3 times a month (15-40 visits)	**32.4%**	**11**
Once a month (6-15 visits)	20.6%	7
Less than once a month (2-5 visits)	20.6%	7
Don't know	2.9%	1
	answered question	**34**
	skipped question	**3**

2. How long do you spend fishing in an average visit (between August and March)? (please select one answer only)

	Response Percent	Response Count
Less than an hour	0.0%	0
An hour or two	2.9%	1
Around half a day	**44.1%**	**15**
Around a full day	**44.1%**	**15**
All night	8.8%	3
	Other (please specify)	1
	answered question	**34**
	skipped question	**3**

1 of 10

3. What time of day do you normally fish (between August and March)? (please select one answer only)

	Response Percent	Response Count
Early morning (before 9am)	17.6%	6
Late morning (9am-12pm)	17.6%	6
Afternoon (12pm-5pm)	20.6%	7
Evening (5pm-8pm)	17.6%	6
At night	**26.5%**	**9**
	answered question	**34**
	skipped question	**3**

4. Do you tend to fish the Humber estuary (please select one answer only)

	Response Percent	Response Count
Alone	35.3%	12
Take my dog	2.9%	1
With partner/one other friend	**38.2%**	**13**
As a groups of friends	23.5%	8
	answered question	**34**
	skipped question	**3**

5. Where do you fish from? (select all appropriate answers)

	Response Percent	Response Count
The sea wall	47.1%	16
The shoreline	**88.2%**	**30**
The sea (from a boat/kayak)	8.8%	3
	answered question	**34**
	skipped question	**3**

6. What do you use to fish? (please select all appropriate answers)

	Response Percent	Response Count
Rod and line	**100.0%**	**33**
Nets/long lines	0.0%	0
	answered question	**33**
	skipped question	**4**

7. Do you seasonally shift where you fish (between August and March)? (please select one answer only)

	Response Percent	Response Count
Yes	**79.4%**	**27**
No	20.6%	7
	answered question	**34**
	skipped question	**3**

8. Do you tend to fish the Humber estuary more at a particular time of year? (please select all appropriate answers)

	Response Percent	Response Count
August	34.4%	11
September	46.9%	15
October	68.8%	22
November	**78.1%**	**25**
December	75.0%	24
January	71.9%	23
February	50.0%	16
March	37.5%	12
	answered question	**32**
	skipped question	**5**

11. Do you buy or dig your own fishing bait? (please select one answer only)

	Response Percent	Response Count
Buy	41.2%	14
Dig	8.8%	3
Buy and dig	50.0%	17
answered question		34
skipped question		3

13. How do you normally travel to the places you fish (between August and March)? (please select one answer only)

		Response Percent	Response Count
Car		100.0%	34
Bicycle		0.0%	0
Walk		0.0%	0
Public Transport		0.0%	0
	answered question		34
	skipped question		3

14. What positively influences your choice of place to fish (between August and March)?

	No influence	Some positive influence	Strong positive influence	Rating Average	Response Count
Travel time from home	**68.8% (11)**	12.5% (2)	18.8% (3)	1.50	16
Car parking nearby	25.0% (2)	**50.0% (4)**	25.0% (2)	2.00	8
Time available	**66.7% (4)**	33.3% (2)	0.0% (0)	1.33	6
Habit	**33.3% (1)**	**33.3% (1)**	**33.3% (1)**	2.00	3
Weather	11.1% (1)	**66.7% (6)**	22.2% (2)	2.11	9
Tide	8.3% (1)	**50.0% (6)**	41.7% (5)	2.33	12
Location of seasonal fish	0.0% (0)	27.8% (5)	**72.2% (13)**	2.72	18
Presence of wildlife	12.5% (1)	37.5% (3)	**50.0% (4)**	2.38	8
Avoidance of others	30.0% (3)	**40.0% (4)**	30.0% (3)	2.00	10
Prefer to fish near others	**83.3% (10)**	8.3% (1)	8.3% (1)	1.25	12
Please list other factors that positively influence your choice of fishing location					9
			answered question		34
			skipped question		3

15. How long have you fished at the Humber Estuary? (please select one answer only)

	Response Percent	Response Count
Less than a year	0.0%	0
Between 1 and 3 years	2.9%	1
Between 3 and 6 years	5.9%	2
Between 6 and 10 years	5.9%	2
Between 10 and 20 years	14.7%	5
Longer than 20 years	**70.6%**	**24**
Other (please specify)		1
answered question		**34**
skipped question		**3**

16. Since you started fishing the Humber estuary, have you noticed any change in the number of other recreational users fishing here? (please select one answer only)

	Response Percent	Response Count
No change	32.4%	11
Yes a decrease	32.4%	11
Yes an increase	**35.3%**	**12**
Please give details and locations of changes		8
answered question		**34**
skipped question		**3**

17. Are you associated with any angling/fishing clubs on the estuary?

	Response Percent	Response Count
Yes	35.3%	12
No	64.7%	22
Please give club name		11
answered question		34
skipped question		3

18. Do you feel there is potential conflict between fishing and other recreational activities on the Humber? (such as sailing, dog walking, bird watching etc)

	Response Percent	Response Count
Yes	35.3%	12
No	64.7%	22
Please give details of other recreational activities which potentially conflict with fishing		9
answered question		34
skipped question		3

19. We would be grateful if you could provide your full postcode so we can calculate the average travel distance of recreational visitors who fish the estuary.

	Response Count
	33
answered question	33
skipped question	4

Appendix 3 – Responses to on-line sailing questionnaire

Sailing - Humber

SurveyMonkey

1. What type of boat do you have? (single answer only)

	Response Percent	Response Count
Sailboat	37.5%	18
Motorboat	10.4%	5
Sail yacht	**50.0%**	**24**
Motor yacht	2.1%	1
Other (please specify)		2
answered question		**48**
skipped question		**2**

2. What are your main sailing interests? (tick as many as appropriate)

	Response Percent	Response Count
Racing	25.0%	12
Cruising	**77.1%**	**37**
Day sailing	66.7%	32
Other (please specify)		0
answered question		**48**
skipped question		**2**

1 of 26

3. Roughly, how often do you take a boat out on the Humber estuary between August and March? (please select one answer only)

	Response Percent	Response Count
Daily	0.0%	0
Most days (180+ visits)	0.0%	0
1 to 3 times a week (40-180 visits)	12.5%	6
2 to 3 times a month (15-40 visits)	**41.7%**	**20**
Once a month (6-15 visits)	20.8%	10
Less than once a month (2-5 visits)	25.0%	12
Don't know	0.0%	0
	answered question	**48**
	skipped question	**2**

4. Which days do you usually take the boat out between August and March? (please select all appropriate answers)

	Response Percent	Response Count
Weekdays	47.9%	23
Weekends	**85.4%**	**41**
Holidays	45.8%	22
	Other (please specify)	6
	answered question	**48**
	skipped question	**2**

5. How long do you spend on the estuary water during an average visit (between August and March)? (please select one answer only)

	Response Percent	Response Count
An hour or two	**37.5%**	**18**
Around half a day	29.2%	14
Around a full day	22.9%	11
All day and overnight	10.4%	5
Other (please specify)		4
answered question		**48**
skipped question		**2**

6. What time of day do you normally take to the water? (please select one answer only)

	Response Percent	Response Count
Early morning (before 9am)	6.3%	3
Late morning (9am-12pm)	2.1%	1
Afternoon (12pm-5pm)	2.1%	1
Evening (5pm-8pm)	0.0%	0
At night	0.0%	0
Always tide related	**89.6%**	**43**
answered question		**48**
skipped question		**2**

7. When you take the boat out do you normally go? (please select a single answer)

	Response Percent	Response Count
Alone	**72.9%**	**35**
With other boats	27.1%	13
Other (please specify)		3
answered question		**48**
skipped question		**2**

8. Do you tend to take the boat our on the Humber estuary more at a particular time of year? (please select all appropriate answers)

	Response Percent	Response Count
August	93.8%	45
September	89.6%	43
October	56.3%	27
November	20.8%	10
December	12.5%	6
January	8.3%	4
February	10.4%	5
March	27.1%	13
April	72.9%	35
May	87.5%	42
June	89.6%	43
July	**95.8%**	**46**
answered question		**48**
skipped question		**2**

9. Which parts of the Estuary do you regularly sail/boat/cruise? (between August and March), please select all appropriate answers

	Response Percent	Response Count
North West (Ouse Bridge to Brough)	37.5%	18
North Central (Brough to Paull)	41.7%	20
North East (Paull to Spurn)	**43.8%**	**21**
South West (Ouse Bridge to South Ferriby)	31.3%	15
South Central (South Ferriby to Cleethorpes)	39.6%	19
South East (Cleethorpes to Mablethorpe)	10.4%	5
Out to sea	41.7%	20
All listed options	16.7%	8
	Other visited locations	10
	answered question	**48**
	skipped question	**2**

10. What influences where you go when you are on the boat (between August and March)?

	No influence	Some influence	Strong influence	Response Count
Tide	2.1% (1)	2.1% (1)	**97.9% (47)**	48
Swell	25.0% (12)	**54.2% (26)**	20.8% (10)	48
Wind	2.1% (1)	25.0% (12)	**72.9% (35)**	48
Habit	**70.8% (34)**	27.1% (13)	2.1% (1)	48
Weather (excluding wind)	10.4% (5)	**47.9% (23)**	43.8% (21)	48
Time	8.3% (4)	**54.2% (26)**	37.5% (18)	48
	Please list other factors that influence where you go on the water			16
			answered question	**48**
			skipped question	**2**

11. How long have you been boating at the Humber Estuary? (please select one answer only)

	Response Percent	Response Count
Less than a year	6.3%	3
Between 1 and 3 years	20.8%	10
Between 3 and 6 years	14.6%	7
Between 6 and 10 years	12.5%	6
Between 10 and 20 years	**25.0%**	**12**
Longer than 20 years	20.8%	10
	Other (please specify)	1
	answered question	**48**
	skipped question	**2**

12. Since you started sailing at the Humber estuary, have you noticed any change in the number of other recreational users sailing/boating here? (please select one answer only)

	Response Percent	Response Count
No change	**75.0%**	**36**
Yes a decrease	20.8%	10
Yes an increase	4.2%	2
Please give details and locations of changes		6
answered question		**48**
skipped question		**2**

13. Are you associated with any sailing/boating clubs on the estuary?

	Response Percent	Response Count
Yes	**75.0%**	**36**
No	25.0%	12
Please give club name		35
answered question		**48**
skipped question		**2**

14. For which months is your boat kept on the water? (tick all that apply)

	Response Percent	Response Count
January	66.7%	32
February	62.5%	30
March	72.9%	35
April	91.7%	44
May	91.7%	44
June	**93.8%**	**45**
July	**93.8%**	**45**
August	89.6%	43
September	91.7%	44
October	91.7%	44
November	72.9%	35
December	68.8%	33
Please detail where you keep your boat (marina/channel/haven mooring)		36
answered question		**48**
skipped question		**2**

15. Do you feel there is potential conflict between sailing and other recreational activities on the Humber? (such as angling, dog walking, bird watching etc)

	Response Percent	Response Count
Yes	2.1%	1
No	97.9%	47
Please give details of other recreational activities which potentially conflict with sailing/boating		9
answered question		48
skipped question		2

Q10. What influences where you go when you are on the boat (between August and March)?		
1	Race or cruise plan	Jan
2	Location of local havens and sheltered areas. Areas away from shipping lanes and the passage of merchant ships Areas away from shallow water and shoal areas	Jan
3	Daylight hours	Jan
4	whether I am alone or with a crew can make a difference. also if i am in the company of other boats.	Dec
5	The experience, ability and needs of the crew of my yacht and the same concideration for those sailing in company. The available depth of the river for a given tide at the current point of that tide.	Dec
6	tend to avoid flocks of birds where possible. As a sail boat, engine used sparingly to avoid hazards if wind dies, and to return to berth	Dec
7	ability of crew and skipper,	Dec
8	Location of race marks at Brough	Dec
9	Daylight hours only	Dec
10	Get a copy of the charts for the humber and upper humber published every 3 and 6 months, Most yachts avoid the shallow water and mud banks.	Dec
11	Nobody will be able to go out from the Marina this January or february as the lock gates are being repaired/serviced. A major factor affecting Estuary usage is the huge amount of silt that has been allowed to build up in the harbour entrance; making entry and exit extremely dangerous if the skipper of a vessel is unaware of this hazard. This silting, will if left to its own devices; block the entrance. There are not that many boatsyachts/canal barges in the marina, owners do not always go out through the locks because like everyone else the cost of fuel has to be considered. The Royal Naval University Training ship has now had to cut her tide ntry time by 1 hour either side of hich water to effect a safe exit and entry....a cause for some concern. Have you looked at the harbour when the tide is right out, this you must do; not just at the harbour but elsewhere along the estuary and further up towards Gainsborough. also look at the York Ouse side. Poor care of the banking and insufficient dredging is creating a choking effect that will influence both wild life and water quality for every living thing nor just birds. By the way have you monitored the noise produced by the cleverly constructed dual carriageway that carries dense numbers of light and heavy traffic 24/7 passed the estruary banks. I have to say from my observations, both as a car driver and skipper of a boat that the birds seem quite happy. Boats tent to be quite quiet in operation.	Dec
12	THe marina has very short times when the lock gates are open this is time dependant.	Dec
13	The wife and family	Dec
14	Pleasure of enjoying sailing	Dec
15	Crew time available	Dec
16	Movements of tidal shipping.	Dec

Q11. How long have you been boating at the Humber Estuary? (please select one answer only)		
1	Also cruised extensively on the River Great Ouse in Cambridgeshire for 4-5 years. Wonderful place to see seals in fresh water no less and watch Cormorants cooling their stomaches wings outstretched, a sight you can observe on the Humber esturay too!	Dec 23, 2011 3:11 AM

Q12. Since you started sailing at the Humber estuary, have you noticed any change in the number of other recreational users sailing/boating here? (please select one answer only)		
1	With the exception of when we are racing against other boats it is only occasionally that we see other recreational boats on the water. For example we sailed in a floatiller of two boats in August at the peak of the holiday season from the Humber to the Wash to Wells Next to the Sea and then to Boston over a five day period and did not see one other single boat other than the RNLI undertaking a training excercise.	Jan 4, 2012 9:39 AM
2	Racing seems to be reduced on the river. The current financial down turn is having a greater effect on the racers than on the cruisers and day sailors. (an aged sail will still carry you, but less efficiently)	Dec 29, 2011 2:48 AM
3	Some increase in 70's and 80's but not recently	Dec 24, 2011 8:10 AM
4	Decrease in yachts sailing from south Ferriby . Decrease from Winteringham Haven (because of silting at Winteringham)	Dec 24, 2011 5:44 AM
5	Less vessels in the marina. Costs and fees making it unpractical to continue. Some owners give up as age defeats them. Some move away to other marinas, areas of Britain where the water is less mud soup like. Check out some of the marinas on the Trent and you will get a wider picture. The economy has not swerved around the boat owning population.	Dec 23, 2011 3:11 AM
6	THe marina seems to have lots of empty berths and talking to others there is a general displeasure with the marina.	Dec 22, 2011 1:29 AM

Appendix 4: WeBS Sectors, Section Numbers and Site Names

Section Number	Description
35478	Grainthorpe to Somercotes
35479	Theddlethorpe to Mablethorpe North End
35480	Theddlethorpe to Saltfleetby
35481	Saltfleet
35483	Donna Nook (Humber)
35484	Somercotes to Donna Nook
35485	Grainthorpe Haven (Humber) Pye`s Hall to Horse Shoe Point
35486	Horseshoe Point to Tetney Haven (Humber)
35487	Tetney Haven to Humberston Fitties (Humber)
38201	North Killingholme Haven Pits
38401	Cleethorpes - North Promenade to Anthony`s Bank
38403	Cleethorpes North Wall to Grimsby
38405	Pyewipe
38406	Killingholme Marshes
38407	Halton Marshes
38409	Barton Cliff
38411	Goxhill Marsh
38412	Goxhill to New Holland
38413	New Holland to Barrow
38414	Barrow to Barton (including Pits)
38415	Barton to Chowder Ness
38417	South Ferriby
38418	Read`s Island Flats
38419	Humber Estuary (South Inner) - Sector B3
38423	Alkborough Flats
38424	Humber Estuary (South Inner) - Sector B1
38430	Blacktoft Sands
38432	Faxfleet to Brough Haven
38433	Brough Haven to North Ferriby
38434	North Ferriby to Hessle Haven
38436	Hessle to Hull
38440	Hull to Paull
38441	Paull to Stone Creek (Cherry Cobb Sands)
38442	Stone Creek to Patrington
38443	Patrington to Easington
38444	Spurn Head
38905	Immingham Docks
38907	River Humber - Howdendyke to Whitgift
38921	Winteringham Haven

Appendix 5: WeBS Sectors and Maximum Bird Counts

Table 35: WeBS data, maximum counts per section, using WeBS core count data. Taken from Cruickshanks et al. (2010), Appendix 1. Grey shading indicates cells with at least 10% of the column total. For details of section see Appendix 4.

Section	Bar-tailed Godwit	Bittern	Black-tailed Godwit	Cormorant	Curlew	Dark-bellied Brent Goose	Dunlin	Golden Plover	Goldeneye	Grey Plover	Knot	Lapwing	Little Tern	Mallard	Oystercatcher	Pochard	Redshank	Ringed Plover	Sanderling	Shelduck	Teal	Whimbrel	Wigeon
35478	388		4	21	181	460	1312	1480		575	4500	5000		96	2050		265	234	188	464	140	16	256
35479	35		4	31	316	4	456	82	7	63	400	670	3	18	48		231	236	442	34	6	4	114
35480	131		15	151	597	330	1066	3170	4	134	1000	2000	18	54	188	1	458	267	152	343	850	69	624
35481	213		17	38	320	1350	2500	4500	22	287	4200	3000	24	26	1522		347	60	65	434	70	17	156
35483	82	1	5	88	155	950	518	4000	2	220	3400	900	2	26	573	2	346	101	145	458	186	9	22
35484	146		5	28	110	1120	1550	2650	1	250	6200	1150	14	160	1300		360	184	350	417	220	36	141
35485	330		23	9	481	2660	1400	3960	0	610	7850	1150	8	18	2510		697	54	54	270	35	5	112
35486	270		0	35	96	1250	420	5000	0	150	3100	5000	3	100	240	0	120	110	200	161	20	4	33
35487	828		0	26	60	800	1584	3560	1	800	7000	1300	0	60	549	0	441	60	142	276	76	11	80
38201	4		4150	3	24	0	1510	185	0	22	15	1805		130	4	11	1720	7		24	137	1	0
38401	900		4	26	141	184	4900	4000	1	1030	12000	760	8	70	910	0	470	400	990	286	36	6	9
38403				0			0							13	4	0	1	2	41	0			0
38405	58		1300	11	495	0	2400	4050	0	76	51	2900		171	46	0	655	119	7	760	7	7	8
38406	0		145	2	92		298	0	1	0	7	525		52	7	22	127	11	0	26	41	0	6
38407	0		41	10	72		246	1941	0	3	1	2025		52	5	42	105	33	0	20	13	1	0

Section	Bar-tailed Godwit	Bittern	Black-tailed Godwit	Cormorant	Curlew	Dark-bellied Brent Goose	Dunlin	Golden Plover	Goldeneye	Grey Plover	Knot	Lapwing	Little Tern	Mallard	Oystercatcher	Pochard	Redshank	Ringed Plover	Sanderling	Shelduck	Teal	Whimbrel	Wigeon
38409	18	2	26	12	40		590	380	16	1	1	260		58	5	49	228	155	1	95	114		46
38411	30		230	4	700	15	423	8500	260	5	30	5620		350	2	115	160	66	35	38	600	4	96
38412	9		88	6	110	1	700	4200	586	2	4	3800		380	5	265	102	9	0	24	51	1	289
38413	4		6	5	42		326	166	1		7	320		263	4	126	250	3		23	17	1	35
38414	8	2	105	27	80	0	490	120	75	0	11	787		475	6	173	152	26		23	58	24	298
38415	0	2		16	51		267	180	15	0	0	600		130	8	153	56	60	0	140	35	0	80
38417	4		0	12	58	0	1079	1120		12	0	530		55	31	0	122	66		38	312		270
38418	77		104	30	1122	0	4553	9000	3	81	24	4500		292	46	4	619	700	5	1033	2500	8	1100
38419				4	109		400	256	0	0		620		77	2		17	45		130	156		1800
38423	1		102	26	180	0	340	2000	0	3		1800		90	13	2	64	29		352	670	0	220
38424				1	115	0	129	1500		1	0	668		10	2	0	14	19		99	161		360
38430	3	2	309	22	96	0	700	18000	7	1	1	7500		540	4	42	233	160	2	64	2225	3	1120
38432	70		19	11	300	0	1241	10840	25	4	11	12250	2	340	12	16	158	274	0	1657	794	4	3660
38433	7	1	27	27	145	0	461	1800	23	1	2	930		156	9	258	114	71		101	153	0	108
38434	11			1	13		73	0	0	0		45		72	7	3	55	42		8	2	0	0
38436	6			5	25		800	0		1	0	260		34	4		150	50		20		1	1
38440	235		696	16	468	0	6447	22559		16	888	4120		391	24	0	1151	325		240	756	1	0
38441	1066		665	20	1310	18	7150	26260	0	1790	2275	14488		1238	96	0	2345	627	13	2153	766	11	674
38442	5900		415	15	1269	220	5443	6380	1	1550	10072	5245	1	527	212	1	1563	325	373	3300	259	4	731
38443	2000		126	12	3000	317	15000	14500	9	5000	22500	1000	2	260	773	2	1500	17	200	4000	34	150	183

Section	Bar-tailed Godwit	Bittern	Black-tailed Godwit	Cormorant	Curlew	Dark-bellied Brent Goose	Dunlin	Golden Plover	Goldeneye	Grey Plover	Knot	Lapwing	Little Tern	Mallard	Oystercatcher	Pochard	Redshank	Ringed Plover	Sanderling	Shelduck	Teal	Whimbrel	Wigeon
38444	900		196	55	549	588	14981	5062	11	851	35004	2200	57	125	2500	15	5400	653	701	700	114	106	260
38905	1		291	28	83		780		0	1	25	205		114	4		663	131	0	106	115	0	0
38907				30	2			3000		15		1350		127	3		45			2	24		94
38921	1		7	0	292		438	6000		4	15	986		190	39		37	100	0	827	860	1	350
Int. Threshold	1200	65	470	1200	8500	2000	13300	9300	11500	2500	4500	20000	490	20000	10200	3500	2800	730	1200	3000	5000	6800	15000
GB Threshold	380	6	430	350	1400	910	3500	4000	200	430	3200	6200	?	680	3200	380	1200	340	620	610	210	1+	4400

Appendix 6: Key Locations for Birds on the Humber

Table 36: Key locations for birds. See map 6.1.

Map Ref	Why important	Species
1	winter feeding area; autumn high tide roost	winter Snow Bunting, Twite (Shorelark); autumn Ringed Plover, Dunlin, Sanderling, Sandwich Tern, Common Tern
2	winter roost	Hen Harrier
3	spring feeding area, autumn feeding / roost	Spring Sanderling, Ringed Plover, Dunlin; Autumn Ringed Plover, Sanderling, Sandwich and Common tern
4	winter feeding	Dark-bellied Brent Goose small numbers of Pale-bellied Brent Goose
5	winter feeding area	Curlew
6	winter feeding / autumn - winter roosting area	winter Dark-bellied Brent Goose feeding; autumn - winter Golden Plover roost and feeding area
7	autumn winter roost	Golden Plover
8	all year feeding; winter feeding	Little Egret concentrations all year; Dark-bellied Brent Goose feeding autumn - winter
9	Roost site pre-migration roost	Common Tern: up to 10,000 nightly mid July - early September with perhaps 50,000 or more birds through the period
10	autumn - winter roost	Golden Plover
11	autumn - winter feeding and roost	Lapwing, Golden Plover
12	autumn - winter feeding roosts	Dark-bellied Brent Goose, Golden Plover, Lapwing
13	High tide wader roost all year	spring Sanderling, Dunlin, Ringed Plover, Grey Plover; autumn Common Tern, Sandwich Tern, Dunlin, Ringed Plover, Knot, Bar-tailed Godwit, Grey Plover
14	high tide wader roost	spring Sanderling, Dunlin, Ringed Plover, Grey Plover; autumn Common Tern, Sandwich Tern, Dunlin, Ringed Plover, Knot, Bar-tailed Godwit, Grey Plover
15	high tide wader roost	Shelduck, Dunlin, Black-tailed Godwit (90% of Humber Black-tailed Godwits roost here mid November - late January), Grey Plover spring, Ringed Plover spring, Curlew all year, Redshank autumn - winter
16	feeding area winter, spring and autumn	Spring and autumn Bar-tailed Godwit, Dunlin, Ringed Plover, Curlew, Grey Plover, Shelduck, Redshank; winter Golden Plover, Lapwing, Black-tailed Godwit, Bar-tailed Godwit, Dunlin, Redshank, Shelduck
17	High tide roost	Curlew
18	winter roost / feeding area	Golden Plover, Lapwing; field use each winter depends on crop type/land management
19	winter feeding / roost	Teal, Shoveler
20	winter - spring feeding	Curlew
21	winter feeding	Curlew
22	autumn winter feeding	autumn Black-tailed Godwit up to 90% of estuary population can be 6000 birds; autumn high numbers of Ringed Plover up to 450, winter Redshank, Dunlin,

		Curlew, Ringed Plover, Shelduck
23	high tide roost; breeding site	Black-tailed Godwit (up to 6400 individuals), Redshank, Curlew in high tide roost, Dunlin; breeding Water Rail, Marsh Harrier, Avocet
24	winter roost / feeding area	Golden Plover, Lapwing, Ruff, Curlew
25	winter feeding / roost	Short-eared Owl
26	winter feeding roost	Curlew, Lapwing, Golden Plover, Pink-footed Goose
27	autumn - winter - spring feeding	Turnstone (up to 550 birds in winter)
28	winter feeding roost	Goldeneye (638 in winter 2011-2012)
29	winter feeding / roost	Turnstone (550 in 2011-2012) , Mute Swan
30	winter feeding / roost, breeding;	Winter feeding / roosting Pochard, Goldeneye, Tufted Duck; breeding Avocet (40 nests 2012); Water Rail (up to 20 pairs), Marsh Harrier, Pochard (up to 25 broods), Bittern, Common Tern, Reed Warbler (up to 300 pairs) Sedge Warbler up to 150 pairs)
31	winter roost / feeding: autumn and spring passage	Winter roost of Pink-footed Geese (internationally important), feeding and roost for Teal, Wigeon, Redshank, Golden Plover, Lapwing, Dunlin, Curlew, Shelduck; autumn and spring passage Curlew, Black-tailed Godwit, Redshank, Dunlin, Ringed Plover, Lapwing
32	breeding site: winter roosts	Breeding Avocets, Marsh Harriers, Redshank; winter roost Pink-footed Goose, Lapwing, Shelduck, Wigeon, Teal, Golden Plover
33	Winter / autumn feeding / roost	Pink-footed Geese, Lapwing, Golden Plover,
34	autumn roost	Golden Plover, Lapwing, Ringed Plover, Dunlin, Curlew
35	breeding; winter feeding / roost; spring/ autumn passage	Breeding Shelduck, Avocets, Bearded Tits, Lapwing, Redshank, Reed Warbler; winter feeding / roost Shelduck, Teal, Wigeon, Lapwing, Golden Plover, Curlew, Dunlin, Black-tailed Godwit; passage Black-tailed Godwit, Ringed Plover, Dunlin, Ruff,
36	winter roost / feeding	winter Golden Plover, Lapwing,
37	breeding; winter feeding roost, autumn / spring passage	Breeding Avocets, Marsh Harriers, Redshank, Lapwing, Bearded Tits, Reed Warblers, Winter roost / feeding Lapwing, Golden Plover, Bearded Tit, Teal, Wigeon, Mallard, Hen Harrier roost, Marsh Harrier (up to 37 birds in 11-12) Autumn / spring passage Ruff,
38	Breeding; winter roost / feeding	Breeding Marsh Harrier, Avocet (occasional), Barnacle Goose, Winter roost feeding Wigeon, Shelduck, Barnacle Goose, Golden Plover, Lapwing, Marsh Harrier (up to 20 in roost) gulls up to 3000 large gulls, Greylag Goose up to 1000,
39	Winter roost	Turnstone up to 300
40	Autumn feeding	Black-tailed Godwit,
41	winter roost / feeding	Golden Plover, Lapwing, Redshank,
42	winter feeding / roost	Golden Plover (up to 20,000) Lapwing,
43	winter feeding / roost	Short-eared Owl,
44	All year high tide roost feeding	Lapwing, Golden Plover, Knot, Dunlin, spring - autumn Ringed Plover, Grey Plover, Curlew, Redshank,
45	winter feeding / roost	Hen Harrier roost, Short-eared Owl,
46	winter - spring - autumn feeding	Knot, Dunlin, Curlew, Redshank, Grey Plover, Ringed Plover, Dark-bellied Brent Goose, Shelduck,
47	winter feeding / roost	Golden Plover, Lapwing, Dark-bellied Brent Goose,

48	Breeding, autumn roost	Breeding Little Tern; autumn Common Tern, Sandwich Tern, Dunlin, Redshank?, Ringed Plover,
49	all year High Tide roost	Knot, Dunlin, Ringed Plover, Sanderling, Turnstone,